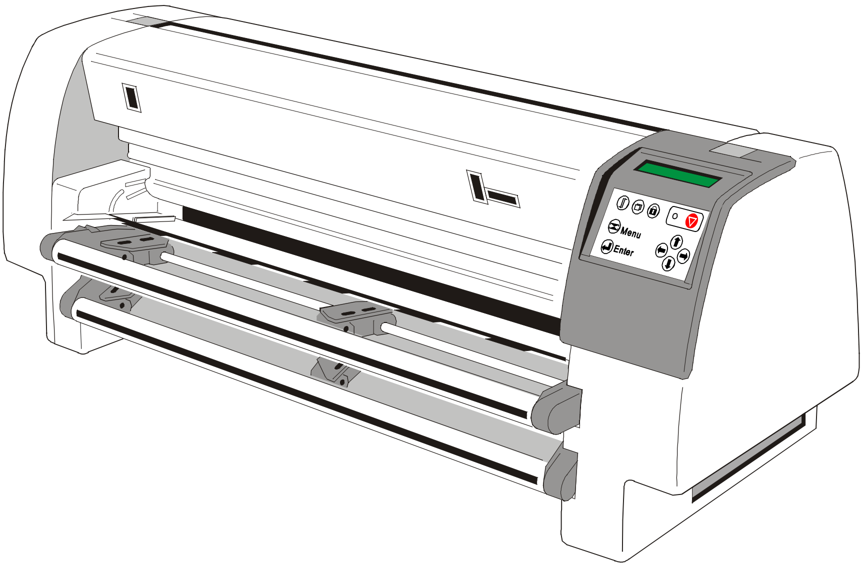
User´s Manual

CI-8060



output solutions

Acknowledgements

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Federal Republic of Germany

January 2002

Great care has been taken to ensure that the information in this handbook is accurate and complete. However, should any errors or omissions be discovered or should any user wish to make suggestions for improving this handbook, please feel encouraged to send us the relevant details.

The contents of this manual are subject to change without notice.

Safety Regulations

The printer **PP 806** (CI - 8060) fulfills the safety regulations according to UL 1950 and
VDE (IEC 950) and CNA/CSA C22.2 / No. 950 for computer systems.

The mains cable must be connected to a ground protected wall-socket. The selected voltage of the printer needs to fit to the local voltage.

The power plug must be easily accessible at any time so that it can be disconnected immediately in case of danger or for maintenance purposes.
Comme le câble de secteur sert de dipositif d'arrêt-urgence, sa connexion à l'imprimante doit être tout le temps accessible.

Before installing the printer, check the surrounding conditions in which the printer will be placed (see next page, Operating Environment).

During a thunderstorm you should never attempt to connect or disconnect any data transfer cables.

The power supply should only be opened and checked by authorized personnel. Repairs and maintenance may only be attempted by authorized personnel as well. Repairs done inappropriately may cause damage and severe danger for the user.

There is a warning symbol to draw the user's attention to possible injuries:



This symbol is visible when the rear cover has been opened. It indicates that the print head is extremely hot after long periods of printing.

Ce signal de danger se présente quand le cache derrière de l´imprimante soit retiré pour indiquer que la tête d´impression peut être extrèmement chaude après imprimer très longtemps.

Electromagnetic Compatibility

We certify that the equipment at issue,

Type: Printer **PP 806** (CI - 8060)

corresponds to the law regulations ruling electromagnetic compatibility of appliances (89/336/EWG) and, therefore, fulfills the requirements for conformity marking with the CE-sign.

For standard printer with serial and parallel interface (Ser/Par PM) please note:
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.
However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on. The user is encouraged to try to correct the interference by one or more of the following measures:

S Reorient or relocate the receiving antenna.
S Increase the separation between the equipment and receiver.
S Connect the equipment into an outlet on a circuit different from the circuit to which the receiver is connected.
S Consult the dealer or an experienced radio/TV technician for help.

For printer with all other interface please note:
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.
Operation of this equipment in a residential area is likely to cause harmful inerference in which case the user will be required to correct the interference at his own expense.

Shielded interface cables should be used with this unit to ensure compliance with Class B limits.

Changes and modifications not explicitly allowed by the equipment's manufacturer could void the user's authority to operate the equipment.

Changes et modifications pas expressément approuvés par le producteur peuvent dévaluer l'autorité d'opérer l'équipement.

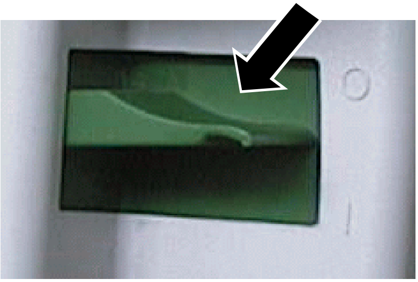
Operating Environment

Avoid installing the printer where it is exposed to moisture or heat (eg. direct sunlight).

S	Temperature:	+ 10 °C to + 35 °C (+50 °F to +95 °F)
S	Humidity:	20% to 80%
S	Humidity with Automatic Sheet Feeder (ASF):	30% to 70%

Power On/Off - Lever

To switch the printer on or off push the Power On/Off - Lever **always down**.



Power - On



Power - Off

Lifting the On/Off - Lever to the zero position won't switch off the printer. Push the On/Off - Lever always down for switching on or off.

Table of Contents

Appendices

Preface

About this Manual

This manual covers the printer in combination with an interface module (Personality Module).

The Personality Module (PM) is an integral part of the printer, and the type of PM used significantly influences the behaviour or operation of the printer.

The structure of this manual is such that the operator is led step-by-step through the various procedures. It starts with the unpacking and setting-up, moves on to detailed instructions for operating the printer and ends with the mounting of options.

The manual is divided into the following chapters:

1. **Getting Started**
   This chapter covers the unpacking and setting-up of the printer and the installation of the PM (Personality Module) and ribbon cassette. By the end of this chapter the printer should be fully functional and tested in its primary form. It is not yet connected to the host computer system and no options are mounted.

2. **Operating the Printer**
   This chapter discusses in great detail the operation of the operator panel, all menu functions, and the general operation of the menu.

3. **Configuring the Printer**
   This chapter explains how to configure the printer so that it can communicate with the corresponding system environment. Then this chapter thoroughly describes the printer's operating controls. In the last part you will find tables with the possible values of the menu items.

4. Description of the Individual Menu Items
In this chapter you will find a detail explanations of individual menu items.

5. Maintenance
This chapter shows how to clean the printer and how to replace the print head.

6. Trouble Shooting and Diagnostics
suggests how to identify and correct simple problems.

7. Options
This is a brief description of all available options. Supplements enclosed in the packaging of options may be inserted here.

8. Technical Data
All technical details or data about the printer can be found here.

Appendix

A. Interface Description
This chapter gives hints about possibilities to connect the printer to the various computer systems and explains particularities depending on the version of the operating system. Additionally, cable connection is illustrated.

B. Print Samples of Resident Fonts

C. Character Set Table
All printer supported character sets are listed in this chapter.

D. **Control Codes**
Quick reference for IBM Proprinter and IBM Proprinter AGM (4207, 4208 XL 24) Emulation.

E. **Control Codes**
Quick reference for EPSOM LQ 2550 and ESC/P2 Emulation.

F. **Control Codes**
Quick reference for Barcode programming.

G. **Miscellaneous**
S System Manager Information

Conventions Used in this Guide

The following conventions are used:

Bold	Headlines and important information.
Note:	Contains special advice to facilitate handling.
Caution:	Contains important information to prevent damage of the equipment.
[ENTER]	Key functions are always depicted in brackets or you will find the symbol of the key e.g  .

Abbreviations and Acronyms

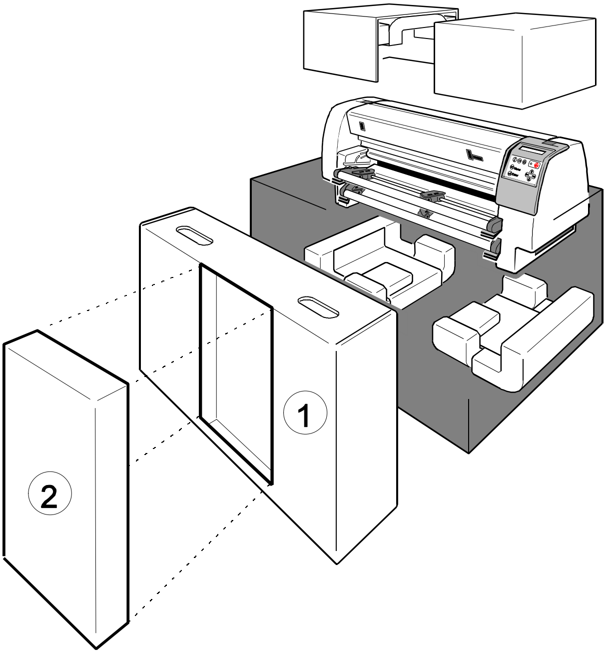
ASF	**A**utomatic **S**heet **F**eeder Cassette for cut sheets and form sets
DRAFT	**Draft** Quality
EE	**E**astern **E**uropean
HSD	**H**igh **S**peed **D**raft
LCD	**L**iquid **C**rystal **D**isplay
LED	**L**ight **E**mitting **D**iode
LQ	**L**etter **Q**uality
MACRO	User defined group (1 bis 4) of stored parameter
NLQ	**N**ear **L**etter **Q**uality
PH	**P**rint **H**ead
PM	Interface (**P**ersonality **M**odule)

1. Getting Started

1.1 Unpacking

Check each item against the check list detailed below. Contact your supplier immediately if any item is missing or damaged.

The package contains the printer and a box (1):



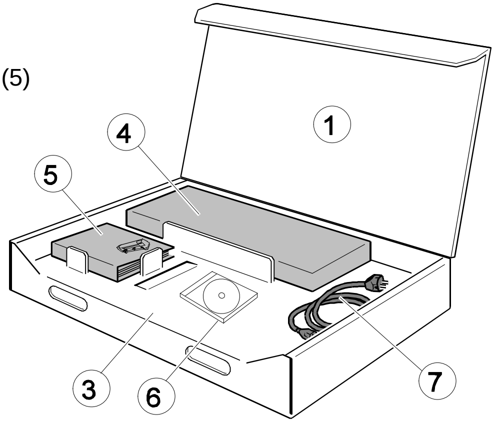
Note: Save all packing material and boxes for future transportation of the printer.

The box (1) contains an additional smaller box (2) with the interface (Personality Module, PM).

The box (1) contains the following:

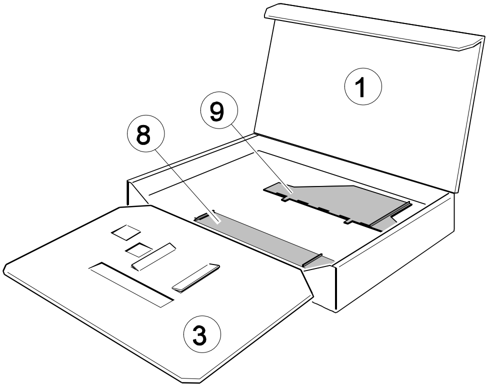
First shelf:

- Ribbon Cassette (4)
- Quick Reference Guide (5)
- CD-ROM (6)
- Power cord (7)



Take the parts (4) to (7) out of the package (1) and open the second cover (3).

Second shelf:

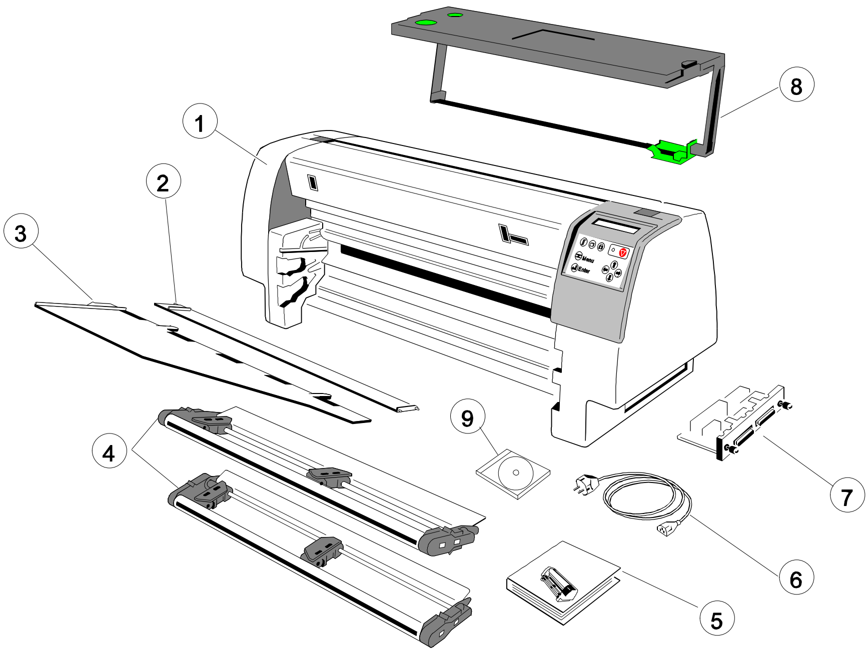


Take out the Paper Insertion Guide (8) and the Manual Sheet Feeder (9).

Lowest shelf:
Turn the box (1) and remove the smaller PM box (2) (see page before).

Check each item against the check list detailed below. Contact your supplier immediately if any item is missing or damaged.

S Printer (1)
S Paper Insertion Guide (2)
S Manual Sheet Feeder (3)
S Two Tractor Cassettes (4)
S Quick Reference Guide (5)
S Power Cord (6)
S Personality Module (PM) (7)
S Ribbon Cassette (8)
S CD-ROM (9)



1.2 Requirements to the location of the printer

Environmental Conditions

S Install the printer in an area away from any heat source, air conditioner, or strong airflow.
S Avoid installing the printer where it is exposed to moisture or heat (eg. direct sunlight).
S Avoid installing the printer in a dusty or humid environment.

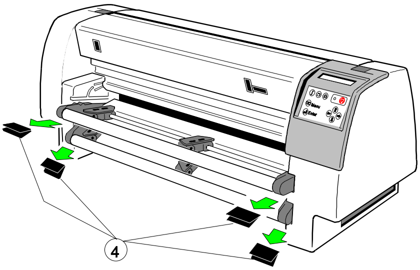
Preconditions for Installation

S Place the printer on the stand or a table.
S When processing fanfold paper always place the printer with its front edge slightly off the edge of the table.

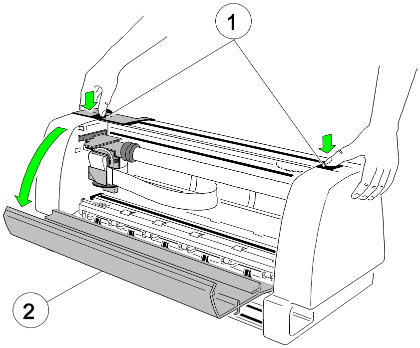
Power Requirements

S No special wiring is required. A typical office wall outlet is sufficient.
S Do not plug into the same wall outlet other equipment besides the printer such as coffee machines, copy machines, or air conditioners.

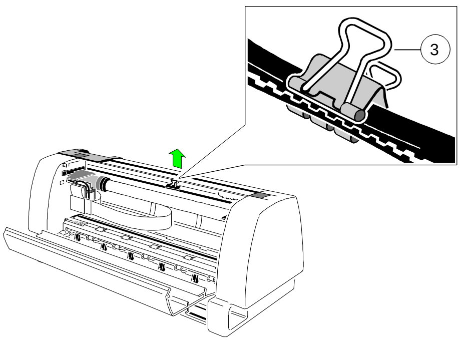
1.3 Remove Transport Lock



Remove all transport locks (4) of the tractor cassettes.



Open the rear cover (2) by pressing the two locking buttons (1) and swivel the rear cover backwards.



Remove the transport lock (3) for the print head carriage.

Re-packing Information

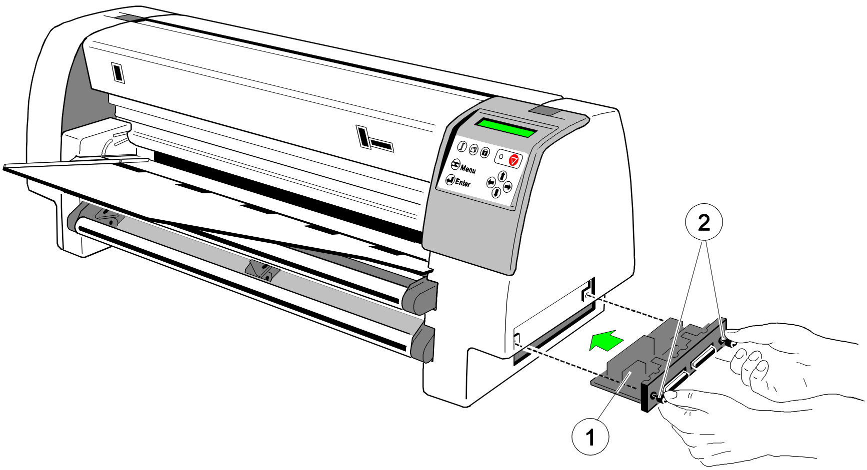
To ensure maximum protection when transporting the printer, always:

- Remove any installed paper handling option.
- Remove the mains cable.
- Remove the ribbon cassette.
- Reposition the transport lock.
- Pack the printer in its original packing material and ship in its original package.

1.4 Installing the Personality Module (PM)

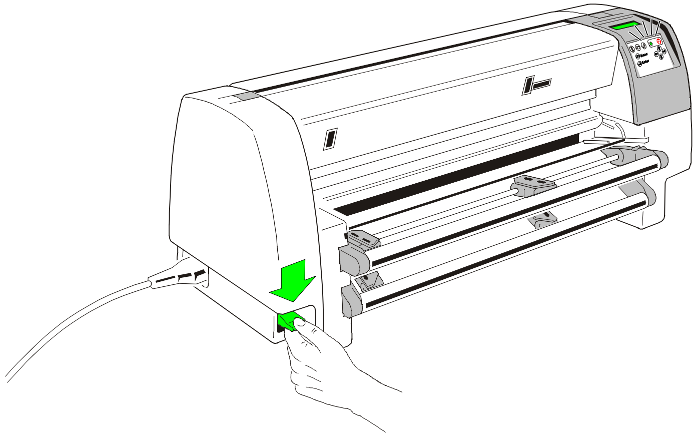
The printer is only operational when an interface is installed, called a Personality Module (PM). The illustration below shows the standard PM with a serial and parallel interface.

Note: Never attempt to install or remove a PM while the printer is switched ON. To avoid damage due to electrostatic discharge, do not touch the pins or components of the PM.



- Insert the Personality Module (1) with the component side upwards until the connector fully engages. Hand tighten the two lock screws (2).

1.5 Mains Connection and Power On



- Connect the printer to the mains using the power cord. First connect the cable to the power cord socket and then to the mains.
- Do not plug into the same wall outlet other equipment besides the printer such as coffee machines, copy machines, or air conditioners.
- The power On/Off lever switches the printer‘s power supply ON or OFF.

Note: Press the lever **always** down.
Since the power cord serves as a safety cut-off, its connection to the printer must be accessible any time.

When switched **ON** the printer performs an internal self-test which checks the electronics, the print head carriage movement, and the interface. Power ON is indicated by a green LED on the operator panel, the first panel message is **TEST....** .

If the message **UNLOCKED - CHECK RIBBON ...** is shown, follow the steps in on page paragraph **1.6 Ribbon Installing**.

After inserting the ribbon press  to continue. When the internal test has been completed successfully the display shows **READY 1 ELQ** or **LOCAL 1 ELQ** if data have already been transmitted.

Note: If the display shows anything different please refer to chapter **6 Trouble-shooting and Diagnostics**.

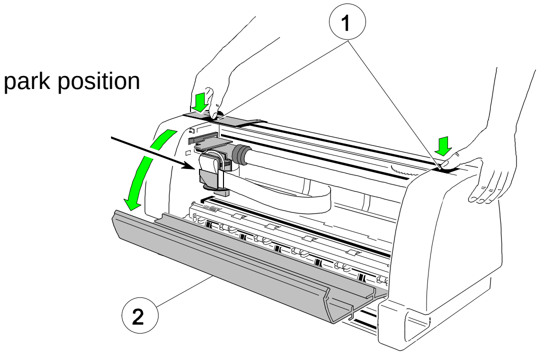
1.6 Ribbon Installation

Note: It is recommended to use only original ribbon cassettes supplied by the printer manufacturer. Using other ribbons will void your warranty.

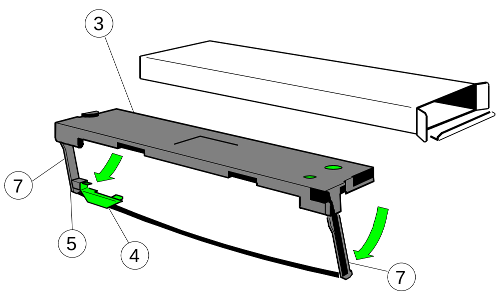
The following procedure describes how the ribbon cassette is installed into the printer for the very first time. Lateron chapter **1.7 Replacing the Ribbon Cassette** is applicable.

Note: The prind head must be always in the park posirtion.

Open the rear cover (2) of the printer by pressing simultaneously the two lokking buttons (1) and swivel the rear cover backwards.

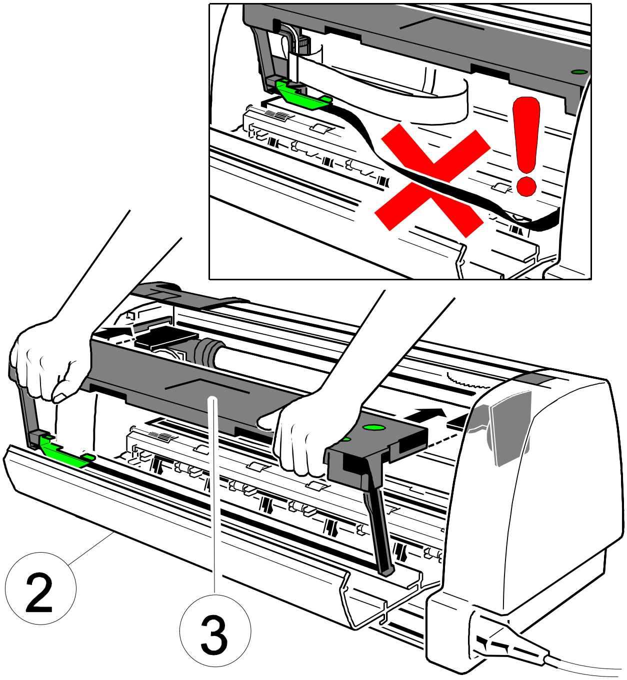


S Pull the right and left arm (7) of the ribbon cassette (3) to the bottom and move the ribbon feed guide (4) into the fixing device (5) at the side.



Note: The ribbon feed guide (4) has to slide into the fixing device (5). The ribbon shall not be tensed.

S Slide the ribbon cassette (3) into the printer.



S Close the rear cover (2) and lock the printer (Press).

1.7 Replacing the Ribbon Cassette

Caution: The print head may be very hot immediately after printing!

S To install the ribbon, the printer must be powered on.
S Put the printer into the **Local Mode**. (Press).
S Unlock the rear cover (2). (Press).
S Open the rear cover (2) of the printer by pressing simultaneously the two lokking buttons, see picture on page before.
S Swivel the rear cover backwards.
S Remove Ribbon Cassette.

For further steps see chapter **1.6 Ribbon Installation**.

1.8 Paper Loading

There are three possibilities for paper feeding:

S Fanfold paper with the two tractor cassettes;
S Single sheets through the manual paper path;
S With the automatic sheet feeder cassettes (ASF-Cassettes, optional). For further information please refer to chapter **7.2 ASF Cassettes**.

1.8.1 Paper Source Selection

The basic selections for PAPER SOURCE are:

S TRACTOR (Default TRACTOR LOWER, indicated by ’)
S MANUAL

Select 'TRACTOR L/U' as paper source on the operator panel

The following diagram shows which keys to press and what is displayed on the operator panel.

Power the printer ON:

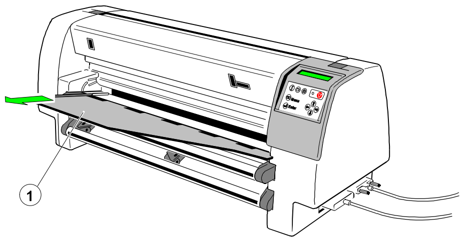
KEY	DISPLAY	
[OFFLINE]	LOCAL	1 ELQ
[MENU]	TEST MODES	o
[DOWN]	DEFINE MACRO	o
[RIGHT]	» SELECT MACRO	o
[DOWN]	» PAPER SOURCE	o
[RIGHT]	» TRACTOR LOWER	r
[DOWN]	» TRACTOR L/U	
[ENTER]	» TRACTOR L/U	r
[ONLINE]	READY	1 ELQ

Note: The settings selected and confirmed are only active until the printer is switched off. In order to prevent losing your new settings you can save them using the function **SAVE MENU** (see chapter **2.4.3 How to Save Settings**.

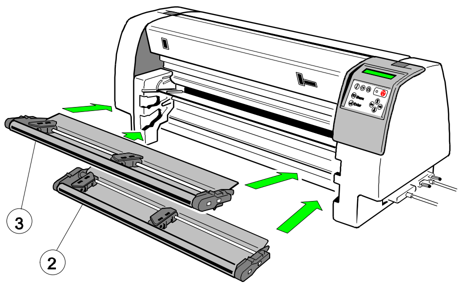
1.8.2 Fanfold Paper Feeding

Note: Ensure that all transport locks are removed.

- The printer has to be placed at the front edge of the table or on the printer stand as described in chapter **7.1 Printer Stand**.
- Remove the manual sheet feeder(1)

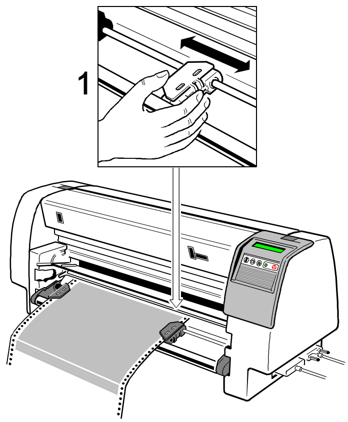


- Insert the lower (2) or the upper (3) tractor cassette, or both.



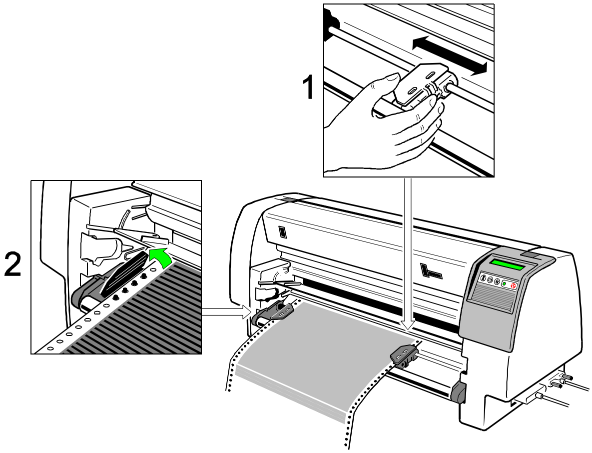
- Step 1: Adjust the tractors roughly to the paper width.

Note: The left tractor is in a fix position.

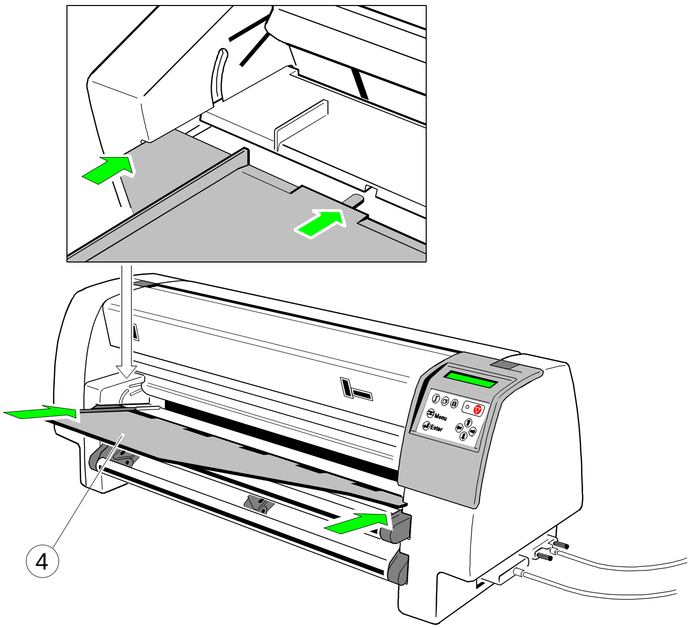


- Step 2: Open the tractor covers, insert the paper, and close the tractor covers.

- Move the right tractor (1) until the paper is straight but not too tight.

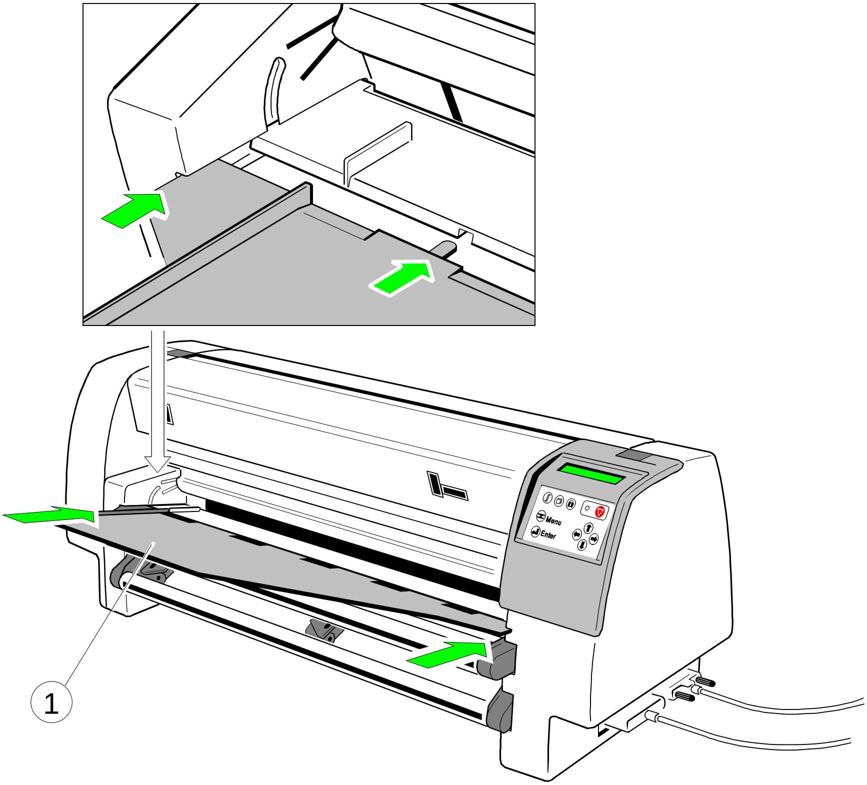


- Insert the Manual Sheet Feeder (4) and initiate a test printout, see chapter **1.9 Test Printouts** to check the margins.



1.8.3 Manual Sheet Feeding

- Insert the Manual Sheet Feeder (1) and connect it to the paper insertion guide:



- Select the paper source **MANUAL** using either the menu function or by means of the corresponding command in your application program, see chapter **1.8.1 Paper Source Selection**.
- Initiate a printout, see chapter **1.9 Test Printouts**.

1.9 Test Printouts

There are four test printouts available.

- **PRINT MENU** shows the current settings of all parameters and the contents of the macros.
- **CONFIGURATION** lists all available fonts and indicates the page counter value.
- **PRINT LETTER** produces a standard letter (ECMA-132) which can be used for measuring the printer's throughput.
- **PRINT LINES** shows a pattern of all printable characters. Use this to check the print qiality as well as the top and left margin.

The following steps show which keys to use to start a test printout.
The printer feeds paper from the defined paper source (default **TRACTOR LOWER**).

KEY	DISPLAY	
[OFFLINE]	LOCAL	1 ELQ
[MENU]	TEST MODES	°
[RIGHT]	» PRINT MENU (or other printout)	
[ENTER]	» PRINT MENU	**r**
[ONLINE]	PRINT MENU (starts printing)	**r**
	» PRNITMENU	
[FORM FEED]	TEAR OFF PAPER (short displayed)	
	» LOCAL	
[ONLINE]	READY	1 ELQ

Sample: PRINT MENU

PRINT OUT FW-VERSION 20xxxxxx HW-VERSION 29xxxxxx FPGA 4.7 PAGE COUNT 50

INTERFACE

I/F TYPE	PARALL./RS232
WORD LENGTH	8 BIT
BAUD-RATE	9600 BIT/S
PARITY BIT	EVEN
PROTOCOL	DTR
DSR/CTS MODE	IGNOR. DSR+CTS
I/F BUFFER	64 KBYTE

MENU ACCESS	FULL ACCESS

	CURRENT SETTINGS	MACRO 1*	MACRO 2	MACRO 3	MACRO 4
PAPER SOURCE	TRACTOR LOWER	TRACTOR LOWER	TRACTOR LOWER	TRACTOR LOWER	TRACTOR LOWER
PAPER EXIT					
PATH	BATCH	BATCH	BATCH	BATCH	BATCH
BATCH CAPACITY	-	-	-	-	-
PRINT POS. ADJ.					
TRACT.L. V-POS	0.0	0.0	0.0	0.0	0.0
TRACT.L. H-POS	0.0	0.0	0.0	0.0	0.0
TRACT.U. V-POS	0.0	0.0	0.0	0.0	0.0
TRACT.U. H-POS	0.0	0.0	0.0	0.0	0.0
MANUAL V-POS	0.0	0.0	0.0	0.0	0.0
MANUAL H-POS	0.0	0.0	0.0	0.0	0.0
BIN 1 V-POS	0.0	0.0	0.0	0.0	0.0
BIN 1 H-POS	0.0	0.0	0.0	0.0	0.0
BIN 2 V-POS	0.0	0.0	0.0	0.0	0.0
BIN 2 H-POS	0.0	0.0	0.0	0.0	0.0
BIN 3 V-POS	0.0	0.0	0.0	0.0	0.0
BIN 3 H-POS	0.0	0.0	0.0	0.0	0.0
PAGE LENGTH	72 LINES	72 LINES	72 LINES	72 LINES	72 LINES
FONT QUALITY	LQ	LQ	LQ	LQ	LQ
GRAPHICS QUALITY	STANDARD	STANDARD	STANDARD	STANDARD	STANDARD
FONT	DATA	DATA	DATA	DATA	DATA
PITCH	10 CPI	10 CPI	10 CPI	10 CPI	10 CPI
LINE	6 LPI	6 LPI	6 LPI	6 LPI	6 LPI
EMULATION	EPSON LQ	EPSON LQ	IBM PROPR.	IBM PROPR. AGM	EPSON LQ
CARACTER SET	EPSON EXT. GCT	EPSON EXT. GCT	IBM SET 2	IBM SET 2	EPSON EXT. GCT
	1: U.S.A.	1: U.S.A.	1: U.S.A.	1: U.S.A.	1: U.S.A.
LEFT MARGIN	1. COLUMNS	1. COLUMNS	1. COLUMNS	1. COLUMNS	1. COLUMNS
RIGHT MARGIN	165. COLUMNS	165. COLUMNS	165. COLUMNS	165. COLUMNS	165. COLUMNS
LINE MODE	LF=LF, CR=CR	LF=LF, CR=CR	LF=LF, CR=CR	LF=LF, CR=CR	LF=LF, CR=CR
PERF. SKIP	YES	YES	YES	YES	YES
TEAR-OFF-MODE	NO	NO	NO	NO	NO

Note: An asterisk (’) after MACRO 1 indicates the actual macro

The values after FW- and HW-VERSION indicates the actual release.

All this standard settings of the firmware will be restored with the menu function **RECALL FACTORY**.

Sample: CONFIGURATION

```
CONFIGURATION           FW-VERSION   202xxxxx   PAGE COUNT      126

C031 ISO 8859/1         CO32 ISO 8859/15        C061 IBM SET 1
C062 IBM SET 2          C063 IBM CODE PAGE      C071 EPSON EXT. GCT
C100 CODE PAGES EE      C101 CODE PAGES EE2

DATA                    ROMAN               NLQ   ROMAN              LQ
SAN SERIF          NLQ  SAN SERIF            LQ   COURIER           NLQ
COURIER             LQ  PRESTIGE            NLQ   PRESTIGE           LQ
SCRIPT             NLQ  SCRIPT               NQ   OCR B              LQ
OCR A               LQ  ORATOR-C            NLQ   ORATOR-C           LQ
ORATOR             NLQ  ORATOR               LQ   DATA LARGE         LQ

ZEICHENSATZ  :     EPSON EXT. GCT     1: U.S.A.

PRINTHEAD NEEDLE

1  2   3   4   5   6  7  8  9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24
```

```
DATA         DRAFT
$ !"#$%&'()*+,-./01234567890:;<=>?@ABCDEF.......
  .
  .
```

The value after FW-VERSION indicates the actual release of the firmware.

Sample: PRINT LETTER

```
Eilzustellung

Norddeutsche Farbwerke KG
Herrn Dr. Grauert
Große Elbstraße 64

2000 Hamburg 4


Org. III 5/37           H-A         4 34             22.04.75
17.04.75 Volkmann

Vordruckgestaltung für den allgemeinen Schrift-
verkehr, für das Bestell- und Rechnungswesen             E i l t

Sehr geehrter Herr Dr. Grauert,

Sie können das Schreiben der Briefe, Bestellungen, Rechnungen usw.
sowie das Bearbeiten des Schriftguts rationalisieren, wenn die
Vordrucke Ihres Unternehmens den folgenden Normen entsprechen:

      DIN 676 Geschäftsbrief; Vordrucke A4
      DIN 677 -; Vordruck A5
      DIN 679 Geschäftspostkarte; Vordrucke A6

      DIN 4991 Vordrucke im Lieferantenverkehr; Rechnung
      DIN 4992 -; Bestellung (Auftrag)
      DIN 4993 -; Bestellungsannahme (Auftragsbestätigung)
      DIN 4994 -; Lieferschein/Lieferanzeige
      DIN 4998 Entwurfsblätter für Vordrucke

Diese Normen enthalten alle Einzelheiten für den sinnvollen und
zweckmäßigen Aufdruck. Wenn dazu bei der Beschriftung genormter
Vordrucke DIN 5008 'Regel für Maschinenschreiben' beachtet wird,
entstehen übersichtliche und werbewirksame Schriftstücke.

Die beifgefügten 6 Mustervordrucke zeigen, daß das Beachten der
Normen die künstlerische und werbewirksame Gestaltung der Vor-
drucke nicht ausschließt.

Da wir uns auf die Herstellung genormter Vordrucke spezialisiert
haben, können wir besonders billig liefern. Eine Probestellung
wird Sie und Ihre Geschäftsfreunde von den Vorteilen überzeugen.

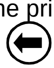
Mit bester Empfehlung

NORAG
Druckerei und Verlagshaus KG


Herrmann

Anlagen

6 Mustervordrucke
```

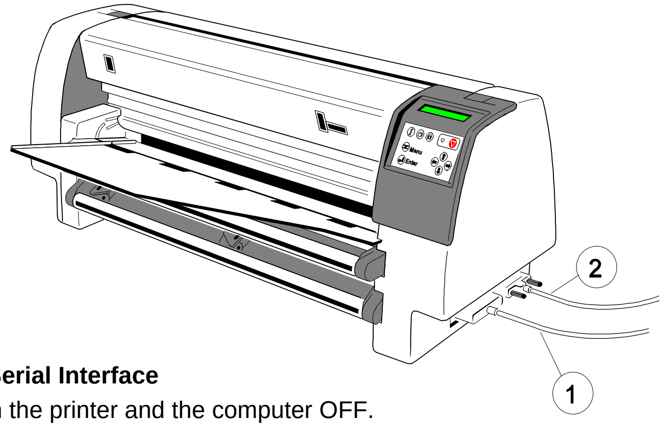
Note: By pressing the key  the print job will be interrupted and then with the following key sequence  and  terminated.

Sample: PRINT LINES

```
ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789!§
§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789!
!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
9!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz012345678
89!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz01234567
789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456
6789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz012345
56789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz01234
456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123
3456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz012
23456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz01
123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0
0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz
z0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxy
yz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwx
xyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvw
wxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuv
vwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstu
uvwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrst
tuvwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrs
stuvwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqr
rstuvwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopq
qrstuvwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnop
pqrstuvwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmno
opqrstuvwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmn
nopqrstuvwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklm
mnopqrstuvwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijkl
lmnopqrstuvwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijk
klmnopqrstuvwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghij
jklmnopqrstuvwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghi
ijklmnopqrstuvwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefgh
hijklmnopqrstuvwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefg
ghijklmnopqrstuvwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcdef
fghijklmnopqrstuvwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcde
efghijklmnopqrstuvwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabcd
defghijklmnopqrstuvwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZabc
cdefghijklmnopqrstuvwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZab
bcdefghijklmnopqrstuvwxyz0123456789!§ABCDEFGHIJKLMNOPQRSTUVWXYZa
```

Note: By pressing the key  the print job will be interrupted and then with the following key sequence  and  terminated.

1.10 Connecting to the System



Parallel/Serial Interface

- Switch the printer and the computer OFF.
- Connect the interface cable coming from the computer to the printer's parallel (1) or serial (2) port.

The following values are default settings, see test printout PRINT MENU on page **1-15**

Word Length:	8 bit
Baud-Rate	9600 BPS
Parity Bit:	Even
Protocol	DTR
DSR/CTS Mode	Ignore DSR+CTS
I/F Buffer	64 K-Byte

After powering the printer ON both interfaces, serial and parallel, are available for data transfer because of the shared mode. The port to which data is sent becomes active automatically.
For changing the parameters, see Appendix **A System Interface Description**

1.11 Installing the Printer Drivers

- You will find the printer drivers on the CD-ROM.

1.12 Emulation Selection

The following emulations are included in the PM Ser/Par:

S	EPSON LQ / ESC/P2	in Macro 1 (Default)
S	IBM ProPrinter XL 24	in Macro 2
S	IBM ProPrinter XL 24 AGM	in Macro 3
S	EPSON LQ / ESC/P2	in Macro 4

To change from one emulation to another, follow the procedure below. The example shows the keys to press along with the display information for a change from **EPSON LQ / ESC/P2** in Macro 1 to **IBM ProPrinter** in Macro 2.

Switch the printer ON. The display shows **READY 1 ELQ**.

KEY	DISPLAY	
[OFFLINE]	LOCAL	1 ELQ
[MACRO SELECTION] (hold the key down and the available marcos are scrolling in the display and stop pressing with selected Macro 2)	MACRO 2	**r**
[ONLINE]	READY	2 IPP

The information **READY 2 IPP** indicates the selected macro and the emulation of this macro, for example:

1 ELQ	Macro 1 with Epson Emulation
2 IPP	Macro 2 with IBM Proprinter Emulation
3 AGM	Macro 3 with IBM Proprinter AGM Emulation
4 ELQ	Macro 4 with Epson Emulation.

Note: A “Macro“ is a summary of application specific parameter settings. It is possible to have a total of four macros, each with a different summary of VALUE settings.
The settings selected and confirmed are only active until the printer is switched off. In order to prevent losing your new settings you can save them using the function **SAVE MENU** (see chapter **2.4.3 How to Save Settings**.

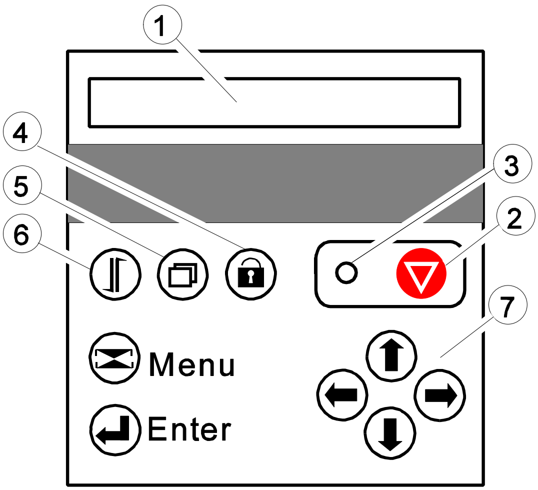
2. Printer Operation

Mos of the printer functions could be executed via operator panel as well as via software commands from the host system. Some functions become only effective with Operator Panel keys, for example: locking/unlocking the printer.

2.1 Operator Panel

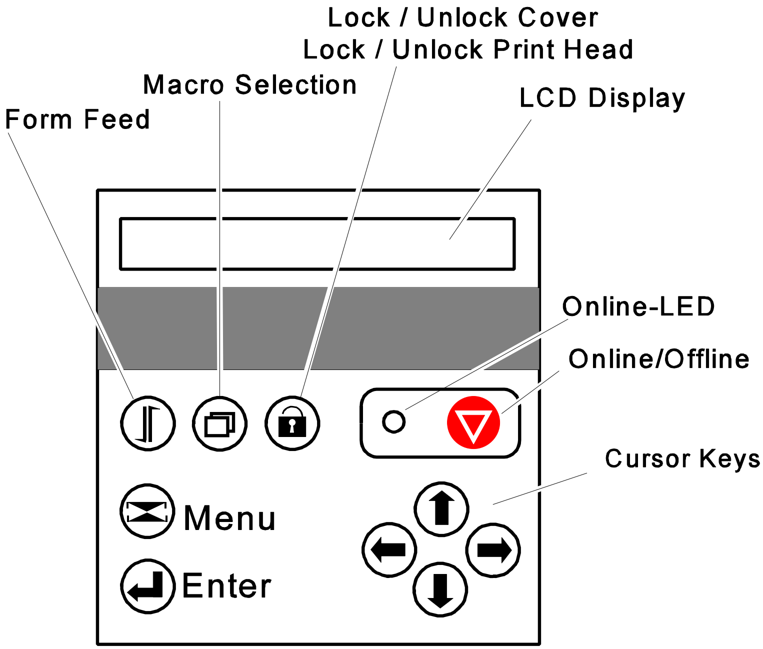
The Operator Panel
- controls the set-up for communication with the host computer;
- controls various parameter settings;
- allows manual control of the paper handling;
- gives information about the printer's status.

1 LCD Display
2 Online / Offline
3 LED
4 Lock / Unlock Cover
  Lock/ Unlock Print Head
5 Macro Selection
6 Form Feed
7 Curser Keys for Navigation
  in the Menu Mode



The LCD Display (1) indicates the current status of the printer. If any error occurs (e.g. **UNLOCKED - ... CHECK RIBBON**) the corresponding error message will be displayed. The green LED (3) lights only if the printer is powered on and in the Ready Mode.

2.2 Function Keys



If the printer is powered on, the display shows **READY 1 ELQ** and the green LED lights. The printer is in the Ready Mode.

The printer works in two different modes, the Ready Mode and the Local Mode. To put the printer into the Local Mode, press the Online / Offline-key  .

Ready Mode
In this mode only the red [Online/Offline] key is active and the green LED lights. By pressing the key the printer changes into the Local Mode and the green Online-LED extinguishes. Further information see chapter **2.2.1**.

Local Mode
Depending on the state of the printer the three leftmost keys have multiple functions. The functions are displayed by keeping the appropriate key pushed. Release the key as soon as the desired function is displayed. Further information see chapter **2.2.2** .

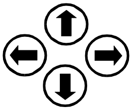
KEY	DISPLAY
[Form Feed]	EJECT PAPER [1]) INSERT MANUAL[1]) INSERT TRACTOR[1]) INSERT TRACTOR U(*pper*)[1]) INSERT TRACTOR L(ower)[1]) PAPER TEAR OFF PAPER PARK FORM FEED REV. FORM FEED
[Macro Selection]	MACRO 1 MACRO 2 MACRO 3 MACRO 4
[Lock Cover/ Unlock Cover]	LOCK COVER UNLOCK COVER UNLOCK COVER/ PH

Note: **PH** means **P**rint **H**ead

The following keys have only one function:

KEY	FUNCTION
[Online / Offline]	After pressing this key, the printer enters the **ONLINE** or **OFFLINE** mode.
[Menu]	**MENU** key - to enter the Menu Mode in the first level.
[Enter]	A selection can be confirmed. To cancel the selection, choose another item and press [ENTER] again. The selection becomes effective by pressing the [ONLINE/OFFLINE] key. Behind the actual displayed parameter appears an asterisk (*).

[1]) depends on paper source

KEY	FUNCTION
 [Cursor] Up, Down, Right, and Left Key	As soon as the menu mode has been activated, the four keys can only be used as cursor keys to move within the menu tree.

2.2.1 READY Mode

In the READY mode only the [Online/Offline] key has a function:

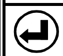
	After pressing that key the printer enters the **LOCAL** mode.

2.2.2 LOCAL Mode

All keys have at least one function. If one key has multiple functions they can displayed by keeping that key pushed:

Note: The corresponding display messages are shown on page before.

	After pressing that key the printer enters the **READY** mode
	1) Rear cover is locked: S Short pressing: Unlocking the rear cover. S Long pressing: Unlocking the rear cover and the print head. 2) Rear cover is unlocked: S Pressing the key: Locking the rear cover (and the print head).

	Single sheet: S only form feed function. Either the form is fed into print position or is ejected. Fanfold Paper: 1) Paper is in Park Position S paper is fed into print position. 2) Paper is in Print Position S paper is fed to the tear off position. S paper is fed into park position. 3) Paper is in Tear Off Position S printer performs a form feed S paper is fed into park position (for this function the paper has to be torn off) S printer performs a reverse form feed
	The four macros are displayed by keeping the key pushed. The actual macro is displayed first. Release the key as soon as the desired macro is displayed. This one will be come the active one. How to confirm and save the selection see chapter **2.4.3 How to Save Settings**.
	Press the [Menu] key to activate the menu mode. The four arrows (up, down, right, and left) can be used as cursor keys to move within the menu tree. The menu tree is shown and explained on the page **Menu-1**. To leave the menu mode press this key again
	With this key a selection will be confirmed. To cancel the selection choose another item and press [Enter] again. The selection becomes effective by pressing the [Online/Offline] key.The selection remains active until the printer is powered off. If the selection should be available after power off it must be saved by means of the menu function „SAVE MENU“ see chapter **2.4.3 How to Save Settings**.

2.3 Liquid Crystal Display (LCD)

The LCD indicator gives information about the status of the printer. In general it can be distinguished between:

- ONLINE messages
- OFFLINE messages

Note: Messages which exceed the 16 character display, e.g. error messages, are horizontally scrolled.

The green LED lights when the printer is in the ONLINE mode and the display shows:

```
READY        1 ELQ
```

When the printer is in the OFFLINE mode status information, error messages, or menu messages are displayed.

Example: The display contents after powering the printer on without a ribbon cassette.

Because of the error case the printer switches into the Offline Mode.

Switch the printer on. The printer performs an internal test:

```
TEST
```

The green LED is flashing and after a short moment the following term is displayed:

```
        UNLOCKED
```

Note: In an error case the printer switches into the Offline Mode.

And then, the message is scrolled:

```
-  CHECK RIBBON.....
```

Insert the ribbon cassette, seechapter **1.6 Ribbon Installation** and press .
The display shows:

```
LOCKING COVER
```

After the locking procedure the display shows:

```
LOCKED
```

In this state it is possible to use all keys.

The printer is still in the OFFLINE Mode due to the previous error condition is cleared now. Press and the printer switches into the ONLINE Mode.

```
READY          1 ELQ
```

2.4 Menu Mode

All selectable features are accessible via the operator panel and combined in the printer MENU.
This feature provides:
- easy configuration (language, etc.)
- quick parameter changes
- activation of test functions

There are three entry points:
- TEST MODES (4 test printouts and a Hexdump-function are available)
- DEFINE MACRO (1 of 4 macros can be selected and its contents defined)
- INSTALLATION (installation specific parameters can be defined)

SAVE MENU is another function at the first level of the menu tree which allows to save all selections permanently in a non-volatile memory.

The menu is organized in three levels:
- Level 1 Main Functions
- Level 2 Subfunctions
- Level 3 Parameters and values

Level 1 (main functions) is entry point into the menu.
There is only one main function in level 1 without an entry into a lower level, SAVE MENU.
In Level 2 (subfunctions) menu functions can be activated or a group of values can be choosen.
In Level 3 (parameters and values at the lowest level) all menu items can be selected/activated.

2.4.1 To Activate the Menu

To activate the menu please follow the next steps:

Press :

The printer changes from the **READY** mode into the **LOCAL** mode.
The display shows:

```
LOCAL          1 ELQ
```

Note: The second term identifies the active macro and the emulation.

Press :

Now, the printer enters the menu mode at the first level of the menu tree.
The display shows:

```
TEST MODES        o
```

Note: As soon as the menu mode has been activated the arrow keys are useable as cursor keys to navigate within the menu tree (up, down, right, and left).

Pres or :

Arrow down or arrow up are used within one level to shift menu functions into the display. The keys have a wrap around function.

```
DEFINE MACRO      o
```

Press :

The display shows:

```
» SELECT MAKRO    o
```

Now, you are at the Subfunction level.

Note: Movement in both directions is possible. Arrow right is used to enter the next lower level and arrow left is used to enter a higher level.

Press :
The display shows:

» PAPER SOURCE °

Press :
Now, you are at the third level. The display shows:

» TRACTOR L/U r

The default value for PAPER SOURCE is TRACTOR L/U (*lower or upper*). At the lowest level, parameters and values, the asterisk (*) to the right indicates the actual selection.

To change this parameter into paper source MANUAL,
press twice .
The display shows:

» MANUAL

Press to confirm the choice:
The display shows:

» MANUAL r

To quit the menu mode press .

2.4.2 To Confirm a Selection

S press ; the confirmed value is marked with an asterisk (r) at the last position as shown in the picture before.

Note: All cursor keys have an autorepeat function.

The menu mode is left either by pressing or by moving to the MAIN FUNCTION level and then pressing the key.

A number of VALUE settings is summarized in a "Macro". Four macros are available, each with a different contents of VALUE settings. The standard emulations are assigned to the macros in following manner:

Macro	**Emulation**
1	Epson LQ ESC/P2
2	IBM Proprinter XL 24E
3	IBM Proprinter XL 24E AGM
4	EPSON LQ ESC/P2

Macro parameters can be tailored to specific application requirements. This feature is highly beneficial in case of frequent changes between applications in a multi-user environment. Instead of having to adjust the menu settings every time before a particular application is started, the user just selects the macro containing the pre-defined set-up configurations.

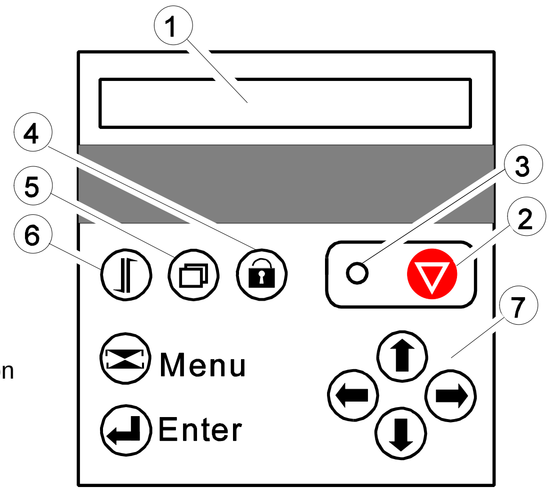
2.4.3 How to Save Settings

The settings selected and confirmed are only active until the printer is switched off. In order to prevent from losing your new settings you can save them using the Main Function **SAVE MENU**.

KEY	Display	
[OFFLINE]	LOCAL	1 ELQ
[MENU]	TEST MODES	o
[UP]	SAVE MENU	
[ENTER]	SAVING NOW (display is flashing)	r
[ONLINE]	READY	1 ELQ

Note: The values of the "current settings" and the macro contents can be printed using the function **PRINT OUT**.

1 LCD Display
2 Online / Offline
3 LED
4 Lock / Unlock Cover
Lock/ Unlock Print Head
5 Macro Selection
6 Form Feed
7 Curser Keys for Navigation
in the Menu Mode



3. Configuring the Printer

3.1 What is Configuring

This chapter describes how to use the operator panel and menu settings to set up or configure your printer so that the printer and your computer system can communicate correctly with each other.

Communication between the two requires that both the computer operating system and the printer have the same communication settings or features. The most important of those are:

- protocol,
- baud rate,
- word length,
- I/F type,
- parity.

You may also need to change some of the printer's other features depending on your hardware and application requirements, for example:

- paper handling
- text processing.

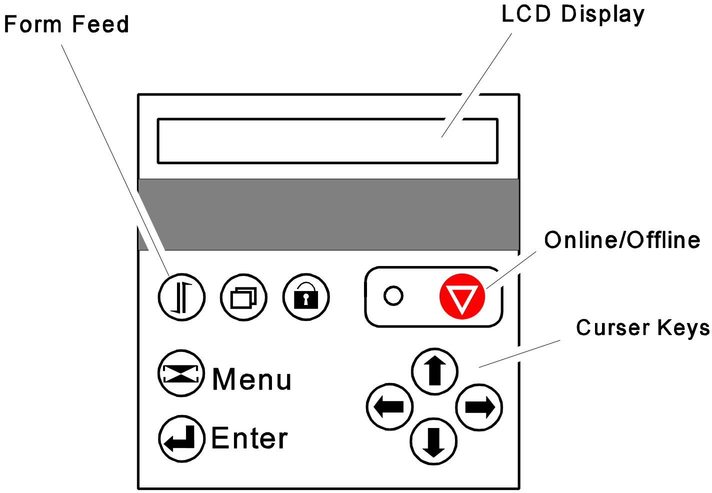
The MENU mode allows you to access the configuration memory. All settings of the printer are stored in this memory and can be printed. The possible settings are discribed in detail on the following pages. A short view of all Menu settings you will find in chapter **3.5 Menu Item Description**, and a detail descriotion in chapter **4 Explanation of Individual Menu Items**.

The standard pameter setting can be printed by using the function **PRINT MENU**. The following steps show which keys to use to start this printout.

Key	Diyplay	
[OFFLINE]	LOCAL	1 ELQ
[MENU]	TEST MODES	º
[RIGHT]	» PRINT MENU	
[ENTER]	» PRINT MENU	r
[ONLINE]	PRINT MENU	r

After feeding paper from the defined paper source the printer starts to print. When printing is completed the following message will be displayed:

	» PRINT MENU	
[FORM FEED]	PAPER TEAR OFF (short displayed)	
	» LOCAL	
[ONLINE]	READY	1 ELQ



3.2 Standard Configuration

The standard Configuration (factory default values) is reflected in the following pintout.

PRINT OUT FW-VERSION 20xxxxxx HW-VERSION 29xxxxxx FPGA 4.7 PAGE COUNT 50

INTERFACE

I/F TYPE	PARALL./RS232
WORD LENGTH	8 BIT
BAUD-RATE	9600 BIT/S
PARITY BIT	EVEN
PROTOCOL	DTR
DSR/CTS MODE	IGNOR. DSR+CTS
I/F BUFFER	8 KBYTE
MENU ACCESS	FULL ACCESS

	CURRENT SETTINGS	MACRO 1*	MACRO 2	MACRO 3	MACRO 4
PAPER SOURCEE	TRACTOR LOWER	TRACTOR LOWER	TRACTOR LOWER	TRACTOR LOWER	TRACTOR LOWER
PAPER EXIT					
PATH	BATCH	BATCH	BATCH	BATCH	BATCH
BATCH CAPACITY	-	-	-	-	-
PRINT POS. ADJ.					
TRACT.L. V-POS	0.0	0.0	0.0	0.0	0.0
TRACT.L. H-POS	0.0	0.0	0.0	0.0	0.0
TRACT.U. V-POS	0.0	0.0	0.0	0.0	0.0
TRACT.U. H-POS	0.0	0.0	0.0	0.0	0.0
MANUAL V-POS	0.0	0.0	0.0	0.0	0.0
MANUAL H-POS	0.0	0.0	0.0	0.0	0.0
BIN 1 V-POS	0.0	0.0	0.0	0.0	0.0
BIN 1 H-POS	0.0	0.0	0.0	0.0	0.0
BIN 2 V-POS	0.0	0.0	0.0	0.0	0.0
BIN 2 H-POS	0.0	0.0	0.0	0.0	0.0
BIN 3 V-POS	0.0	0.0	0.0	0.0	0.0
BIN 3 H-POS	0.0	0.0	0.0	0.0	0.0
PAGE LENGTH	72 LINES	72 LINES	72 LINES	72 LINES	72 LINES
FONT QUALITY	LQ	LQ	LQ	LQ	LQ
GRAPHICS QUALITY	STANDARD	STANDARD	STANDARD	STANDARD	STANDARD
FONT	DATA	DATA	DATA	DATA	DATA
PITCH	10 CPI	10 CPI	10 CPI	10 CPI	10 CPI
LINE	6 LPI	6 LPI	6 LPI	6 LPI	6 LPI
EMULATION	EPSON LQ	EPSON LQ	IBM PROPR.	IBM PROPR. AGM	EPSON LQ
CARACTER SET	EPSON EXT. GCT	EPSON EXT. GCT	IBM SET 2	IBM SET 2	EPSON EXT. GCT
	1: U.S.A.	1: U.S.A.	1: U.S.A.	1: U.S.A.	1: U.S.A.
LEFT MARGIN	1. COLUMNS	1. COLUMNS	1. COLUMNS	1. COLUMNS	1. COLUMNS
RIGHT MARGIN	165. COLUMNS	165. COLUMNS	165. COLUMNS	165. COLUMNS	165. COLUMNS
LINE MODE	LF=LF, CR=CR	LF=LF, CR=CR	LF=LF, CR=CR	LF=LF, CR=CR	LF=LF, CR=CR
PERF. SKIP	YES	YES	YES	YES	YES
TEAR-OFF-MODE	NO	NO	NO	NO	NO

Note: An asterisk (’) after MACRO 1 indicates the actual macro

The values after FW- and HW-VERSION indicates the actual release.

All this standard settings of the firmware will be restored with the menu function **RECALL FACTORY**.

3.3 Explanation of the printout on the previous page

in the headline behind the term **VERSION** the revision level of the printer's firmware can be found.

Then, two columns of hardware related settings follow:

INTERFACE - for communication between the computer operating system and the printer it is necessary to have the same protocol settings.

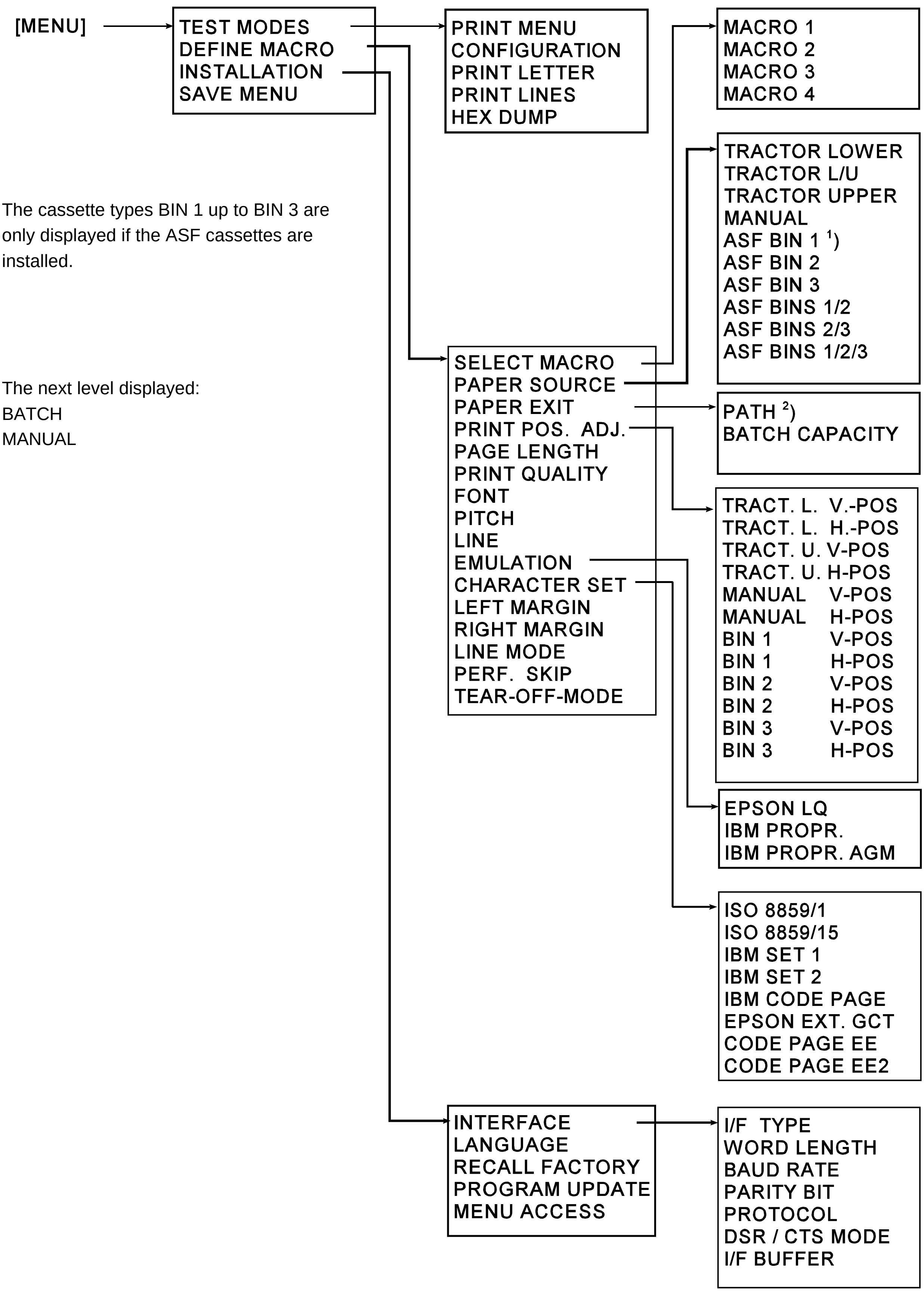
S	I/F TYPE	PARALL./RS232
S	WORD LENGTH	8 BIT
S	BAUD-RATE	9600 Bps
S	PARITY BIT	EVEN
S	PROTOCOL	DTR
S	DSR / CTS MODE	IGNOR. DSR+CTS
S	I/F BUFFER	64 KBYTE

There is no automatic protocol sensing.

The last part of the printout is a list of all **MACRO** settings.
In this case **MACRO 1** is marked with an asterisk (*) which identifies it as the active macro.

Whenever you make modifications in the active macro without saving them you will find the new settings under the heading **CURRENT SETTINGS**. Unless they are saved, the modifications will stay active only until the printer is switched off. When the printer is switched on again the macro settings marked with the asterisk will be reactivated.

3.4 Menu Tree



[1]) The cassette types BIN 1 up to BIN 3 are only displayed if the ASF cassettes are installed.

[2]) The next level displayed:
BATCH
MANUAL

Note: for detail settings of the possible parameters see next tables and the description in chapter 4.

3.5 Menu Item Description

The following tables show menu modes, submenus and parameters. Precondition is: Access to all menu items is alloved. (MENU ACCESS = ALL) Otherwise restrictions are to observed.

An asterisk (**i**) indicates the factory settings. For detail settings see chapter **4 Explanation of Individual Menu Items**.

3.5.1 Test Modes

Entry Point = **TEST MODES**

Selection	**Function**
PRINT MENU	Printout of the current settings
CONFIGURATION	List of all available fonts, the firmware version, and the page counter value
PRINT LETTER	Produces a standard letter (ECMA-132)
PRINT LINES	Shows a pattern of all printable characters
HEX DUMP	Pintout including all control characters

3.5.2 Select Macro

Entry Point = **DEFINE MACRO**

Selection	**Value**
SELECT MACRO	MACRO 1 **r** MACRO 2 MACRO 3 MACRO 4

3.5.3 Paper Source

Entry Point = **DEFINE MACRO**

Selection	**Parameter**
PAPER SOURCE	TRACTOR LOWER **r** TRACTOR L/U TRACTOR UPPER MANUAL ASF BIN 1 [1]) ASF BIN 2 ASF BIN 3 ASF BINS 1/2 ASF BINS 2/3 ASF BINS 1/2/3

[1]) The cassette types ASF BIN 1 up to ASF BIN 3 are only displayed if the ASF cassettes are installed.

3.5.4 Paper Exit

Entry Point = **DEFINE MACRO** o **PAPER EXIT**

Selection	**Parameter / Value**
PATH	BATCH **r** MANUAL
BATCH CAPACITY	BATCH CAP.) (range:) ; 20 up to 600; steps = 20)

3.5.5 Print Position Adjustment

Entry Point = **DEFINE MACRO º PRINT POS. ADJ.**

Selection	Parameter / Value
TRACT.L. V-POS Tractor Lower Vertical Position	TRACT.L. V. 0.0 **r** (Range: -24.0 up to 99.9; Step: $^1/_6$ inch)
TRACT.L. H-POS Tractor Lower Horizontal Position	TRACT.L. H. 0.0 **r** (Range: -6.0 up to 6.0; Step: $^1/_{10}$ inch)
TRACT.U. V-POS Tractor Upper Vertical Position	TRAKT.U. V. 0.0 **r** (Range: -24.0 up to 99.9; Step: $^1/_6$ inch)
TRACT.U. H-POS Tractor Upper Horizontal Position	TRACT.U. H. 0.0 **r** (Range: -6.0 up to 6.0; Step: $^1/_{10}$ inch)
MANUAL V-POS. Manual Vertical Position	MANUAL V. 0.0 **r** (Range: -1.5 up to 24.0; Step: $^1/_6$ inch)
MANUAL H-POS. Manual Horizontal Position	MANUAL H. 0.0 **r** (Range: -6.0 up to 6.0; Step: $^1/_{10}$ inch)
BIN 1 V-POS. Bin 1 Vertical Position	BIN 1 V. 0.0 **r** (Range: -1.5 up to 24.0; Step: $^1/_6$ inch)
BIN 1 H-POS. Bin 1 Horizontal Position	BIN 1 H. 0.0 **r** (Range: -6.0 up to 6.0; Step: $^1/_{10}$ inch)
BIN 2 V-POS. Bin 2 Vertical Position	BIN 2 V. 0.0 **r** (Range: -1.5 up to 24.0; Step: $^1/_6$ inch)
BIN 2 H-POS. Bin 2 Horizontal Position	BIN 2 H. 0.0 **r** (Range: -6.0 up to 6.0; Step: $^1/_{10}$ inch)
BIN 3 V-POS. Bin 3 Vertical Position	BIN 3 V. 0.0 **r** (Range: -1.5 up to 24.0; Step: $^1/_6$ inch)
BIN 3 H-POS. Bin 3 Horizontal Position	BIN 3 H. 0.0 **r** (Range: -6.0 up to 6.0; Step: $^1/_{10}$ inch)

3.5.6 Page Length

Entry Point = **DEFINE MACRO**

Selection	Value
PAGE LENGTH	72 Lines **r** (Range: 1 up to 144 Zeilen)

3.5.7 Print Quality

Entry Point = **DEFINE MACRO** o **PRINT QUALITY**

Selection	Parameter
FONT QUALITY	LQ / NLQ (DRAFT for font DATA)
GRAPHICS QUAL.	STANDARD **r** WIN.LQ 180 DPI WIN.NLQ 90 DPI WI.DRAFT 60 DPI

3.5.8 Font

Entry Point = **DEFINE MACRO**

Selection	Parameter
FONT	DATA **r** ROMAN LQ / NLQ SANS SERIF LQ / NLQ COURIER LQ / NLQ PRESTIGE LQ / NLQ SCRIPT LQ / NLQ OCR B LQ OCR A LQ ORATOR-C LQ / NLQ ORATOR LQ / NLQ DATA LARGE

3.5.9 Pitch

Entry Point = **DEFINE MACRO**

Selection	Value
PITCH	10 CPI **r** 12 CPI 15 CPI 17 CPI 18 CPI 20 CPI PROPORTIONAL

3.5.10 Line

Entry Point = **DEFINE MACRO**

Selection	Value
LINE	2 LPI **r** 3 LPI 4 LPI 6 LPI 8 LPI 12 LPI

3.5.11 EMULATION

Entry Point = **DEFINE MACRO**

Selection	Value
EMULATION	EPSON LQ **r** IBM PROPR. IBM PROPR. AGM

3.5.12 Character Set

Entry Point = **DEFINE MACRO o CHARACTER SET**

Selection	Value/ Parameter
ISO 8859/1	
ISO 8859/15	
IBM SET 1 / IBM SET 2	1: U.S.A. **r** 2: FRANCE 3: GERMANY 4: U.K. 5: DENMARK 6: SWEDEN 7: ITALY 8: SPAIN 9: JAPAIN 10: NORWAY 11: DENMARK 2 12: SPAIN 2 13: LATIN AM. 14: TURKEY
IBM CODE PAGE	1: PAGE 437 **r** 2: PAGE 850 3: PAGE 860 4: PAGE 863 5: PAGE 865 6: PAGE 858
EPSON EXT. GCT	1: U.S.A. **r** 2: FRANCE 3: GERMANY 4: U.K. 5: DENMARK 6: SWEDEN 7: ITALY 8: SPAIN 9: JAPAIN 10: NORWAY 11: DENMARK 2 12: SPAIN 2 13: LATIN AM. 14: TURKEY 15: LEGAL

Selection	Value/ Parameter
CODE PAGE EE	1: CP 437 GK 2: CP 851 GK 3: CP 928 GK 4: CP 855 CYRI 5: CP 866 6: CP 869 7: CP 852 8: KAMENICKY 9: ISO LATIN 2 10: MAZOVIA 11: CP 437 HUN 12: CP 852 SEE 13: CP 866 LAT 14: CP WIN LAT2
CODE PAGE EE2	1: CP 771 2: CP 773 3: CP 774 4: CP 775 5: BALTIC RIM

3.5.13 Left Margin

Entry Point = **DEFINE MACRO**

Selection	Value
LEFT MARGIN	1. POSITION **r** (Range: 1 up to 16; Step $^{1}/_{10}$ inch)

3.5.14 Right Margin

Entry Point = **DEFINE MACRO**

Selection	Value
RIGHT MARGIN	136. POSITION **r** 165. POSITION 80. POSITION 132. POSITION (measuring unit $^{1}/_{10}$ inch))

3.5.15 Line Mode

Entry Point = **DEFINE MACRO**

Selection	Value
LINE MODE	LF = LF, CR = CR **r** LF = LF + CR CR = LF+CR LF, CR = LF + CR

3.5.16 Perforation Skip

Entry Point = **DEFINE MACRO**

Selection	Parameter
PERF. SKIP	YES **r** NO

3.5.17 Tear Off Mode

Entry Point = **DEFINE MACRO**

Selection	**Wert / Parameter**
TEAR-OFF-MODE	NO **r** TEAR-OFF 10 S. TEAR-OFF 1 S.

3.5.18 Interface

Entry Point = **INSTALLATION º INTERFACE**

Selection	**Parameter / Value**
I/F TYPE	PARALL. / RS232 **r** PARALL. / RS422 PARALLEL
WORD LENGTH [1])	7 BIT **r** 8 BIT
BAUD-RATE [1])	1200 BPS **r** 2400 BPS 4800 BPS 9600 BPS 19200 BPS 38400 BPS
PARITY BIT	EVEN **r** ODD NONE
PROTOCOL	DTR **r** XON / XOFF XON / XOFF + DTR

Selection	Parameter / Value
DSR / CTS MODE	IGNOR. DSR+CTS **r** DSR+CTS ACTIVE CTS ACTIVE DSR ACTIVE
BUFFER	64 KBYTE **r** 32 KBYTE 8 KBYTE 1 KBYTE

[1]) Only indicated if the serial (RS232 or RS422) interface is selected.

3.5.19 Language

Entry Point = **INSTALLATION**

Selection	VALUE
LANGUAGE	ENGLISH **r** DEUTSCH FRANCAIS

3.5.20 Recall Factory

Entry Point = **INSTALLATION**

Selection	Function
RECALL FACTORY	All standard default settings of the firmware will be restored but not saved.

3.5.21 Program Update

Entry Point = **INSTALLATION**

Selection	**Function**
PROGRAM UPDATE	A new firmware version can be down loaded from the host system via the interface cable. All parameters will be reset to their factory default value.

3.5.22 Menu Access

Entry Point = **INSTALLATION**

Selection	**Parameter**
MENU ACCESS	FULL ACCESS **r** NO ACCESS

4. Description of the Individual Menu Items

Main Functions and Entry Points into the menu

The following Main Functions are available:

S **TEST MODES**
There are 4 test printouts and the hexdump function available. (For detail information see chapter **4.1** beginning on the next page).

S **DEFINE MACRO**
Behind this menu point there are all functions and parameters to define a macro. (For detail information see chapter **4.2**).

S **INSTALLATION**
In the first Sub Function named INTERFACE you can manipulate parameters to enable communication with the host. (See Chapter **4.3**).

S **SAVE MENU**
Any desired changes to the default settings can be saved here. After power on the new settings are activated.

While this function is operating the display flashes **SAVING NOW**.

4.1 TEST MODES

- **PRINT MENU**
  This test printout shows the current settings of all parameters and the contents of the macros. This printout is helpful for future reference and when macros are to be changed. For detail see chapter **3.2 Standard Configuration**.

- **CONFIGURATION**
  This test printout lists all available fonts, contains the page count to identify the actual number of printed pages, and gives information on technical releases which are intended for service purposes. A sample you will find in chapter **1.9 PRINT MENU**.

- **PRINT LETTER**
  This test printout produces a standard letter (ECMA-132) which can be used for measuring the printer's throughput. See a sample in chapter **1.9 PRINT MENU**.

- **PRINT LINES**
  Tis test printout shows a pattern of all printable characters. Use this to check if the printer operates correctly. See a sample in chapter **1.9 PRINT MENU**.

- **HEX DUMP**
  This function allows to analyze that the data received by the printer. Control codes are no longer carried out, instead all data is printed in hexadecimal format and as ASCII characters. Any non-printable characters, such as carriage return are only represented as a single dot (**.**) in the ASCII list.

  It may happen that the transmission of data to the printer will be interrupted during Hex Dump. In this case, printing of data received after the break is started on the next available line. The result is an irregular right margin which is not an indicator for any loss of data.

4.2 DEFINE MACRO

S **SELECT MACRO**

To select one of the four macros which can be used for quickly changing the printer settings for different applications. For example: Application A needs fanfold paper with a top margin of one, application B processes fanfold paper in a batch with a top margin of six. Simply by pressing Macro Selection key the macro containing the information for the specific application requirements can be activated.

S **PAPER SORCE**

The printer offers three choices for paper source:

S **TRACTORT** (fanfold paper)

S **MANUAL** (single sheet)

S **ASF CASSETTES** (optional)

They can be accessed either individually or bundled in a pool. Any combination of cassettes can be selected.

Note: Please refer to chapter **8 Technical Data**, for detailed media specifications.

S **PAPER EXIT**

It is possible to define **PATH** and **BATCH CAPACITY**. The desired paper exit can be selected via operator panel or software.

S **Parameters of PATH**

BATCH (default) and **MANUAL** are selectable.

MANUAL is for single sheet only with output to the front.

S Values for **BATCH CAPACITY** are in the range from) (for no setting = default); and 20 up to 600 in steps of 20.

S **PRINT POS. ADJ.**

This function adjusts the print position in the current macro for the six different paper paths **TRACT. L.V-POS**, **TRACT. L.H-POS**, **TRACT.U.V-POS**, **TRACT. U.H-POS**, **MANUAL V-POS**, **MANUAL H-POS** or **ASF BIN x V-POS**, **ASF BIN x H-POS** (x = 1 up to 3) to exactly position the printout in relation to the top edge of the form in use. It is meant to be a corrective parameter to compensate variations in paper size and pre-printed material.

This parameter covers a range of:

S fanfold vertical: -24.0 up to 99.9 in steps of $^1/_6$ inch,
S fanfold horizontal: - 6.0 up to 6.0 in steps of $^1/_{10}$ inch
S manual or bins vertical: - 1.5 up to 24.0 in steps of $^1/_6$ inch,
S manual or bins horizontal: - 6.0 up to 6.0 in steps of $^1/_{10}$ inch
where "**-**" is up the page and "**+**" is further down the page.

Caution: The set up of PRINT.POS.ADJ. will become effective on the next page of the form. Therefore, it is recommended to define PRINT.POS.ADJ. as long as the paper is in the park position and before starting the print job.

S **PAGE LENGTH**

Page length is expressed in terms of lines within the range of 1 to 144 lines. Any page length setting is based on six lines per inch, regardless of the number of lines per inch selected in the line setting or defined by the application.

The following table shows the number of lines for the most common paper sizes:

Paper length in inches	Appropriate setting in no. of lines
4	24
4 $^1/_6$	25
6	36
8	48
8 $^1/_2$	51
11	66
11 $^2/_3$	70
12 (default setting)	72

The page length setting is the basis from which perforation skip, TEAR-OFF and margins are calculated.

An incorrect page length, therefore, leads to an incorrect perforation skip.

- **PRINT QUALITY**

  Is splitted up into:

  - **Font Quality**

    Four different font quality levels can be selected:

    - High Speed Draft (font "Data")
    - Draft quality (font "Data")
    - Near letter quality (NLQ displayed with the font name)
    - Letter quality (LQ displayed with the font name).

  and

  - **Graphics Quality**

    Four different graphics quality levels can be selected:

    - Standard
    - Win. LQ 180 DPI
    - Win. NLQ 90 DPI
    - WI. Draft 60 DPI

  Different print qualities result in different print speed.

- **FONT**

  A font is a family of characters with the same style and size. The appearance of the font can be varied by using attributes such as: size, bold, italic, etc.

  The fonts included in the PM are:

  - Data) Roman
  - Sans Serif) Courier
  - Prestige) Script
  - OCR B) OCR A
  - Orator-C) Orator
  - DATA LARGE

  see Appendix B for print samples.

  Note: The printtest **CONFIGURATION** lists all available fonts. The firmware of the printer comprises also barcodes. Detail information for printing barcodes can be found in Appendix **F Barcodes Quick Reference**.

S **Pitch**

Defines the number of characters printed per inch (10, 12, 15, 17, 18, 20 or proportional).
Any pitch setting can be combined with any available font. In some cases this might lead to a conflict with font designs. The pitch setting is, therefore, a matter of personal taste.

S **LINE**

Determines the number of lines per inch (line space).

S **EMULATION**

The emulation determines the set of commands available for the printer (see **Appendix D** and **E**). You can activate the following emulations:

S **EPSON LQ / ESC/P2**
S **IBM PROPR.**
S **IBM PROPR. AGM**

The selected emulation is also part of the actual macro. With a change of the macro (e.g. key is pressed) it may happen that the emulation will also be changed.
Be careful: Do not change the emulation within an application.

.

S **CHARACTER SET**

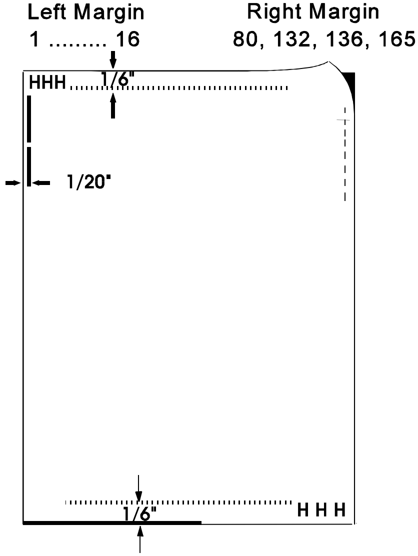
When selecting a character set it can be further specified by the correspon-ding national versions.

Detailed print samples are found in **Appendix B** and the Character Set Tables in **Appendix C**.
If a different macro is selected the default character set may change as well.

e.g. S **IBM PROPR.** emulation has the character set **IBM SET 2** as default.
S **EPSON / EDC/P2** emulation has the character set **EPSON EXT.GCT** as default.

- **LEFT MARGIN**

  The left margin is set in 1/10" steps, depending on the actual selection. The first left margin position is 1/20" from the left edge of the paper which means that the letter **H** in regular "Data" font would be positioned 1/20" from the left edge of the paper. The left margin can be set to a maximum of 16/10".



- **RIGHT MARGIN**

  The right margin is set to print position 80, 132, 136, or 165, always measured from the position of the first possible, not actual, left margin setting.

- **LINE MODE**
  - If **LF = LF + CR** is selected the printer performs a line feed and additionally a carriage return (CR) for every line feed (LF) received via the interface.
  - If **CR = LF + CR** is selected the printer performs a carriage return an additionally a line feed (LF) for every carriage return (CR) received via the interface.

- **PERF. SKIP**

  If PERF. SKIP is set to YES the printer starts to print after the specified top margin and stops printing before the bottom margin.
  If PERF. SKIP is set to NO the printer ignores top and bottom margin and prints from the very first to the very last line. That means that on a standard 11" paper 66 lines are available for printing.

- **TEAR-OFF-MODE**

  There are three possible settings within this mode:
  - NO
  - TEAR-OFF 10 S.
  - TEAR-OFF 1 S.

  When TEAR-OFF is selected the printer waits for one or ten seconds and, unless further data are received, advances the paper to the first perforation behind the text.
  Regardless of this setting, whenever a change from fanfold to another paper source occurs the printer will request the fanfold paper to be torn off before the paper is moved into the park position.

4.3 INSTALLATION

- **INTERFACE**
  - **I/F TYPE** (**I**nterface **T**ype)
    The following types are available:
    - **PARALLEL / RS232**
    - **PARALLEL / RS422**
    - **PARALLEL**

    In case the **PARALLEL / RS232** or **PARALLEL / RS422** interface type is selected the printer switches automatically between the parallel and serial interface. The first data received at the port determine which interface port becomes active. The other interface port will be closed so that only one interface is active at a time (for detailed information see Appendix **A Interface Description).**

    The factory setting for the interface type are: PARALL./RS232, 8 bit word length, 9600 baud rate, even parity bit, DTR protocol, ignore DSR+CTS, and 8 Kbyte Buffer.

  - **WORD LENGTH**
    Number of bits that represent a word; values are 7 or 8 bit

  - **BAUD RATE** (Only indicated if the serial interface is selected)
    Controls the speed of data transfer. Possible transfer rates are: 600, 1200, 2400, 4800, 9600, 19200 or 38400 bps.

  - **PARITY BIT** (Only indicated if the serial interface is selected)
    The data transfer will be checked by an even or odd parity bit. The values are: **EVEN**, **ODD**, or **NONE**.

  - **PROTOCOL** (Only indicated if the serial interface is selected)
    Selectable are: **DTR**, **XON/XOFF**, or **XON/XOFF+DTR**.

- **DSR/CTS MODE** (Only indicated if the serial interface is selected)
  Selectable are: **IGNORE DSR+CTS**, **DSR+CTS ACTIVE**, **CTS ACTIVE**, or **DSR ACTIVE**.

- **I/F BUFFER**
  Buffer size in Kbyte. The maximum (factory setting) size is 64 Kbyte.

- **LANGUAGE**
  The operator panel may display its messages in three languages. Select one out of the following: **ENGLISH**, **DEUTSC**H, or **FRANCAIS**.

- **RECALL FACTORY**
  All standard default settings of the firmware will be restored. The contents of Page Counter and the Paper-in Adjust will not be changed. Use the function **SAVE MENU** if the standard settings shall be stored permanently.

- **PROGRAM UPDATE**
  A new firmware version can be down loaded from the host system via the interface cable. All parameters will be reset to their factory default value.

- **MENU ACCESS**
  There are two possibilities to define the user's access rights to the menu.
  - **FULL ACCESS** All functions can be used (default)
  - **NO ACCESS** The menu is not accessible at all. Only the menu item **TEST MODES** is available.

Note: It is the system manager's responsibility to grant access to the menu when **NO ACCESS** was selected.

5. Maintenance

Prefered Material

The following materials and cleaning lubricants are recommended whem maintaining thr printer:

- Lint-free cloth
- Vacuum cleaner.

5.1 Cleaning Surrounding Areas

The user should clean the printer every six months or after 50,000 prints, whatever occurs first. If you experience paper feed problems or if the print head carriage movement is hampered, cleaning should be carried out more often.

Note: The Page Counter (PGCNT) in the PRINT MENU will inform about the actual number of printed pages (see illustration on the next page) .

PRINT MENU

CONFIGURATION FW-VERSION 202xxxxxPAGE COUNT 126

C031 ISO 8859/1	C032 ISO 8859/15	C061 IBM SET 1
C062 IBM SET 2	C063 IBM CODE PAGE	C071 EPSON EXT. GCT
C100 CODE PAGE EE	C101 CODE PAGE EE2	

DATA		ROMAN	NLQ	ROMAN	LQ
SANS SERIF	NLQ	SANS SERIF	LQ	COURIER	NLQ
COURIER	LQ	PRESTIGE	NLQ	PRESTIGE	LQ
SCRIPT	NLQ	SCRIPT	NQ	OCR B	LQ
OCR A	LQ	ORATOR-C	NLQ	ORATOR-C	LQ
ORATOR	NLQ	ORATOR	LQ	DATA LARGE	LQ

ZEICHENSATZ : EPSON EXT. GCT 1: U.S.A.

PRINTHEAD NEEDLE

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

DATA DRAFT
$!"#$%&'()*+,-./01234567890:;<=>?@ABCDEF.......
.
.

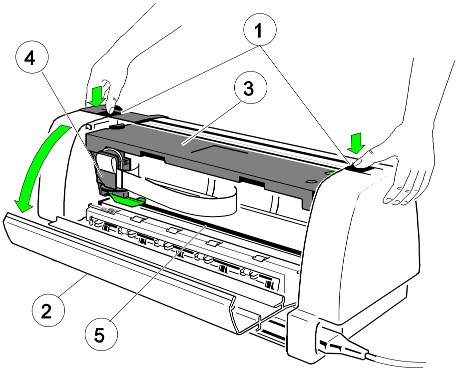
Note: FW-VERSION indicates the revision level of the firmware.

5.2 Cleaning Procedure

S Power the printer ON:

S To open the rear of the printer :

- S Press  to change into the **LOCAL** mode.
- S Press  until **UNLOCKED** is displayed.
- S Press the left and right unlocking buttons (1) simultaneously and open the rear cover (2).



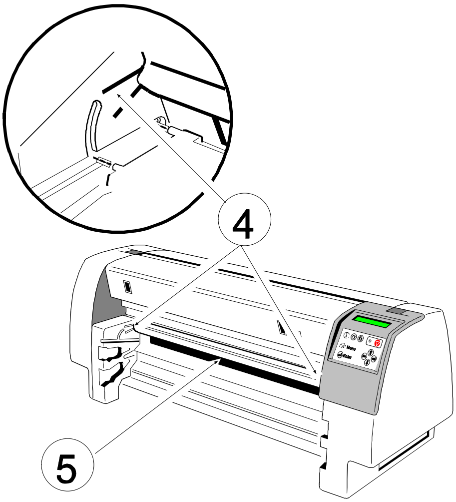
1 Locking Buttons
2 Rear Cover
3 Ribbon Cassette
4 Print Head (in park position)
5 Print Bar

- S Remove the ribbon cassette.
- S Thoroughly brush and vacuum all accessible areas to remove any paper particles and dust.

S Open the front cover of the printer:

S Remove the Manual Sheet Feeder, Tractor Cassettes, and the Paper Insertion Guide.

S Press the left and right plastic leads (4) and open the front cover (5).



S Clean the paper pressure rollers and the transport rollers.

S Clean the covers and the operator panel with a damp, lint-free cloth. Do not use cleaning solvents or excessive amounts of water.

S Insert the ribbon cassette (see chapter **1.6 Ribbon Installing**).

S Close the front cover and press  until **LOCKED** is displayed.

S Pressing  causes the printer to enter the **READY** mode.

5.3 User Replaceable Parts

The print head has an expected life time of approximately 600 Mio. characters.

5.3.1 Print Head Exchange

Note: The print head may be very hot immediately after printing.

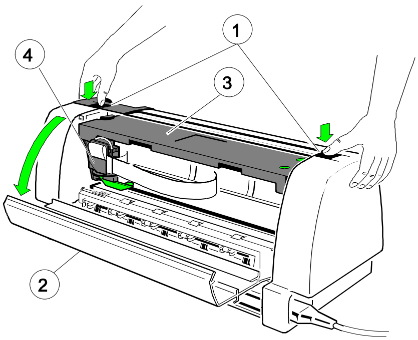
S Power the printer ON:

S To open the rear of the printer :

S Press (▽) to change into the **LOCAL** mode.

S Press (🔒) until **UNLOCK COVER / PH** is displayed. Now the rear cover **and** the print head are unlocked. (PH means print head).

S Release the rear cover (2) by pressing simultaneously the two lockingbuttons (1) and swivel the rear cover backwards.

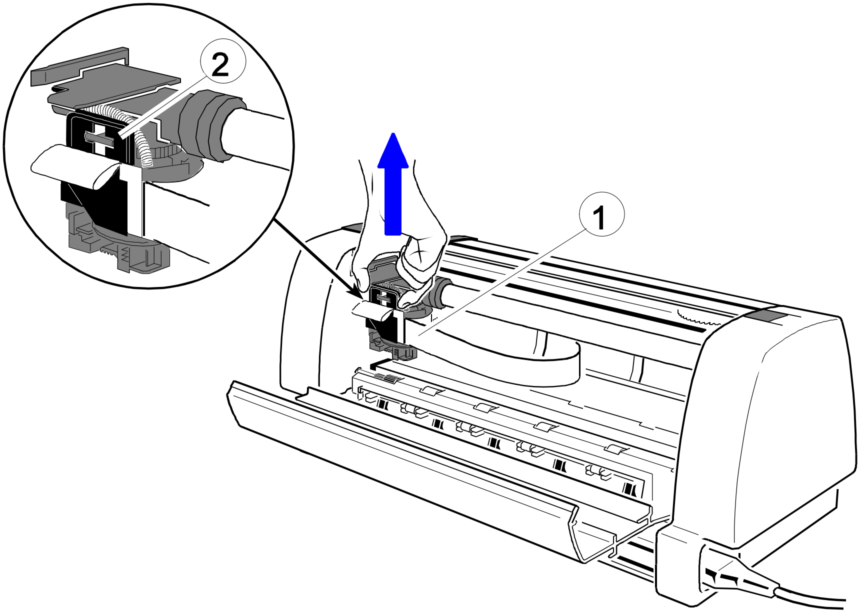


1 Locking Buttons
2 Rear Cover
3 Ribbon Cassette
4 Print Head (in park position)

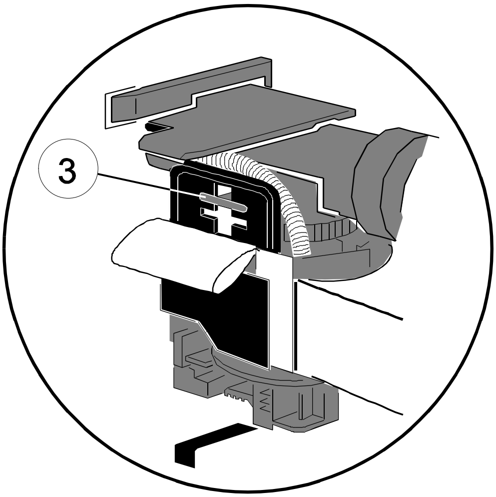
S Slide out the Ribbon cassette (3) to the rear.

S Power the printer OFF.

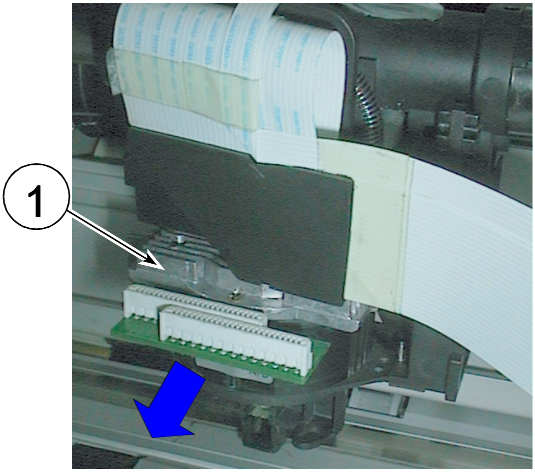
S Disconnect the print head cable (4) carefully by pullingblack the plastic holder (5) upwards.



S The loose print head cable remains on the plastic holder (5a).

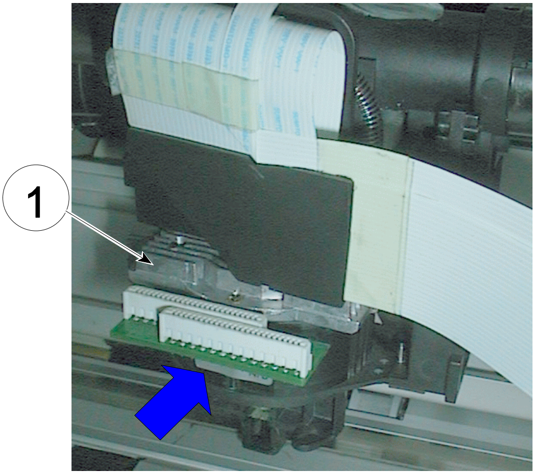


S Slide the print head (6) out of the fixation support.

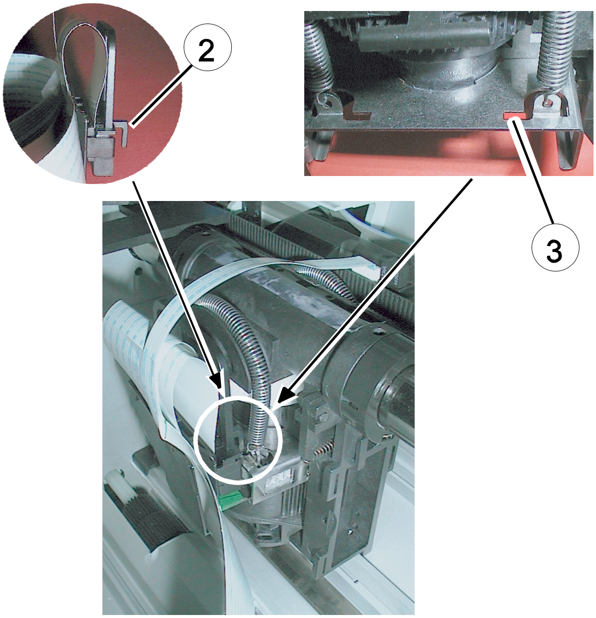


5.3.2 Installation procedure:

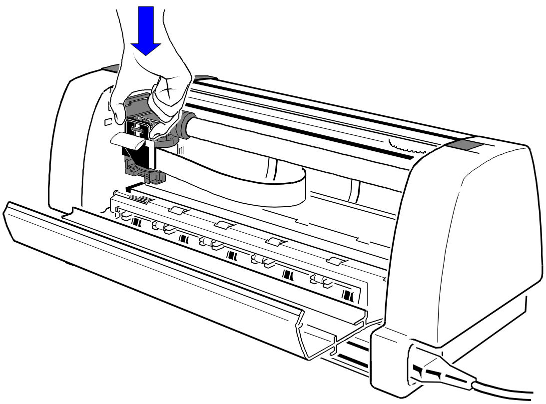
S Put the new print head (6) into its fixation support and slide it in.



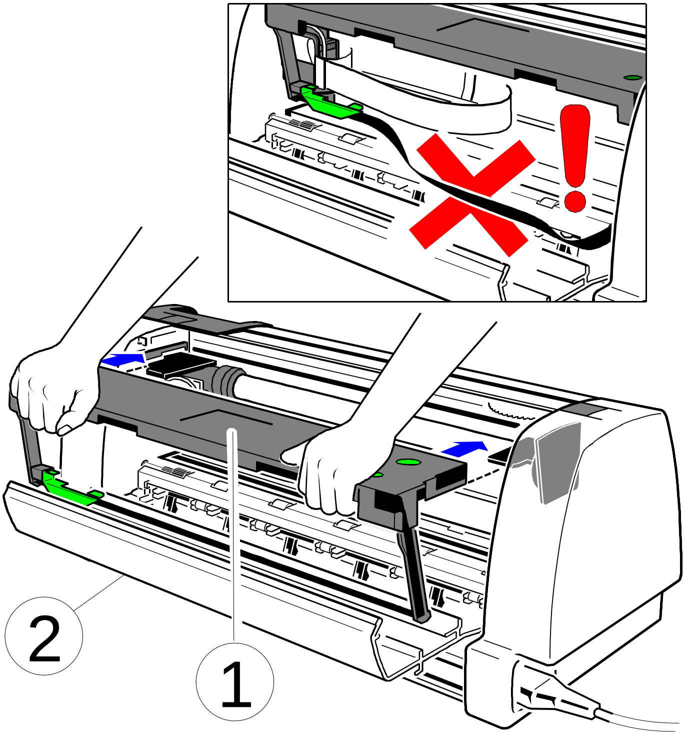
- Put the plastic pin (7) into the hole (8) of the carriage for adjusting the print head cable.



- After finding the right position connect the print head cable by pressing the plastic holder down (with strong pressure).



- Insert the ribbon cassette (3) and close the rear cover (2) of the printer.



- Power the printer ON.

- The LED is flashing and the display shows:
  UNLOCK (CHECK RIBBON...).

- Lock cover by pressing (lock key) key . The print head will be locked automatically.

- Print out one test page to ensure that the printer works correctly after the print head replacement. See next page.

KEY	DISPLAY	
	LOCAL	1 ELQ
[MENU]	TEST MODES	º
[ARROW RIGHT]	» PRINT MENU	
[ARROW DOWN]	» CONFIGURATION	
[ENTER]	» CONFIGURATION	**r**
[ONLINE]	CONFIGURATION (start of the print out)	**r**
	» CONFIGURATION	
[FORM FEED]	PAPER TEAR OFF (short displayed)	
	» STOP	
[ONLINE]	READY	1 ELQ

Note: If it doesn't work open the printer again. Press print head cable and its connector once more together. Close the printer and repeat the test printout.

6. Troubleshooting and Diagnostics

How to Use This Section

1. Find the category to which your problem belongs. The problem categories are:

S Power-related Problems
S Error Messages
S No Printout
S Operation-related Problems
S Print-related Problems
S Ribbon or Carriage-related Problems

For example, if the print appears very light on the paper, look into Section "**Print- related Problems**".

2. Find the symptom description that most closely matches the printer symptom. In this example you would look at the symptom "**Print faint or of poor quality.**"
3. Try the first suggestion under that head line.
4. If the suggestion does not cure the problem try the next suggestion.
5. If none of the suggestions enables you to continue printing or if the fault is not listed contact your service office.

Each time the printer is switched ON the display indicates TEST while the internal self-tests are run. If the test is completed successfully **READY 1 ELQ** will be displayed. If an error message is displayed please refer to the following section.

6.1 Power-related Problems

Power indicator does not light when power is switched On:

- Check that the power cord and plug are securely fitted to the printer and to a mains outlet.
- Ask for the power connector connections (and fuse) to be verified.
- Ask for the building electrical supply to be verified.
- PM correct inserted ?

6.2 Error Messages

After switching the power ON the printer runs a self test. During the test the following messages may show up on the display:

Display	That means ...	Cause
No information, POWER ON LED not not lit	No power or	• Mains cable not connected. • PM not installed • PM not property installed
LED lit but no reaction	Hang up in reset after power on	• print PSU defective • Print CU-DEV defective

After all tests have been passed successfully the following message will be displayed:

READY 1 ELQ or **BUSY 1 ELQ**	Printer is OK	• Printer ready for operation

During normal operation the following error messages may occur :

Note: In an error case the printer change into the OFFLINE mode. After error correction press  key to change back again into the READY mode.

If an error correction is not possible call the service of **your dealer**!

Display	**That means ...**	**Cause / Action**
BUFFER OVERFLOW	Handshake protocol error	S Check CTR - CTS or XON/XOFF protocol S Check connector S Repeat data transfer
CARRIAGE ERROR	Horizontal drive without function	S Paper jam S Print gap incorrect S PCC-value too low S Ribbon feed guide isn´t aligned with print head S Horizontal drive blocked S Encoder strip not in correct position S Encoder strip is dusty S Encoder strip missing S Horizontal motor fault S Print CU-DEV defective S AGC procedure on not workable position S No AGC ADJUST after print head replacement

Display	That means ...	Cause / Action
CHECK TOF POS	Perforation isn´t adjusted with the tear off edge	S Adjust the perforation of the form with the tear off edge by pulling the paper forwards or backwards S Check if print head is in its park positon S Ribbon cassette correct installed ? S see also diagram **6.8.5 Paper Jam TRF**
ELECTR-FAN ERROR	Fan error	S Press  key again S Hardware error; call service
FRAMING ERROR	Protocol error serial interface	S Check protocol setting of printer and host S Repeat data transfer
GAP ERROR	Print gap incorrect, green ribbon support not in right position	S Printer not locked S Wrong distance between print head and print bar S Pins of the green ribbon support broken S Check if print head is in its park positon S See also diagram **6.8.7 Gap Error** S Error still there call service
LOCK COVER	Housing will be locked	S Wait
MOTOR FAN ERROR	H-motor fan error	S Press  key again S Hardware error; call service

Display	That means ...	Cause / Action
PAPER JAM ASF	There are obstructions in the paper path	S Remove any obstacles S See also diagram **6.8.6 Paper Jam ASF**
PAPER JAM MANUAL	There are obstructions in the paper path	S Remove any obstacles S Close front cover S See also diagram **6.8.6 Paper Jam Manual**
PAPER JAM TRF	Tractor cassette: S Feeding incorrect S No paper feeding S Not enough feeding S Too much feeding by tearing off After power on: S No paper inserted	 S Check paper path S Correct paper position? S Paper movement wrong S Close front cover S Insert paper S See also diagram **6.8.5 Paper Jam TRF**
PARITY ERROR	Protocol error serial interface	S Check protocol setting of printer and host S Repeat data transfer
PRINT HEAD ERROR	Problems with the print head incline	S No ribbon run S Pins on print head carriage defective; call Service S Unlock print head and lock it again (see diagram **6.8.1 Locking Procedur**)
PROCESS TIMEOUT	Firmware error	S Press ▽ key again S Switch printer off and on S Error still there, call service

Display	That means ...	Cause / Action
REMOVE PAPER	The paper sensor is covered	S Remove paper S Close front cover
RIBBON ERROR	Ribbon problems	S Unlock printer S Open printer S Check ribbon cassette
SYSTEM ERROR	Problems with the system or the firmware	S Switch printer off and on S Error still there, call service
UNLOCKED - CARRIAGE ERROR	S Horizontal drive without function S Printer locking procedure faulty	S Open printer S Check ribbon S Check if print head is in its park positon S Lock printer (see diagram **6.8.1 Locking Procedur**)
UNLOCKED COVER	Rear cover will be unlocked	S Wait
UNLOCKED - CHECK RIBBON ...	S No ribbon cassette detected S Printer unlocked	S Check ribbon cassette S Move print head into park position S Lock printer (see diagram **6.8.1 Locking Procedur**)
UNLOCKED - RIBBON ERROR	Ribbon problems	S Open printer S Check ribbon cassette S Lock printer (see diagram **6.8.1 Locking Procedur** or **6.8.3 Ribbon Error**)

6.3 No Printout

- **Self-test printout does not start**
  - Make sure that you have closed the cover.
  - Check if paper is loaded in the printer.
  - Refer to paragraph **1.8 Paper Loading**.

- **Printing does not start**
  - Make sure that the READY or BUSY message is displayed. If there is a different message displayed please look into the above error message table.
  - Make sure that the printer is connected to the host computer. (Refer to paragraph **1.10 Connecting to the System**). Make sure that connectors are properly fixed at both ends.
  - Make sure that the printer is receiving data from the host computer.
  - Make sure that the correct protocol is enabled. (Refer to page and appendix **A Interface Description**).
  - Make sure that you have selected the correct port (if the shared mode has not been selected).
  - Make sure that paper is loaded.
  - Make sure that the ribbon is installed.
  - Examine the ribbon path.
  - The ribbon feed guides are not in the right posotion (see paragraph **1.6 Ribbon Installation**)

- **Fanfold paper does not advance**
  - Make sure that the right paper tractor is selected.

- **Single sheet paper does not advance**
  - Make sure that the paper source MANUAL or BIN x (x = 1 up to 3) is selected.

6.4 Operation-related Problems

- **Paper is not positioned at perforation for tear-off**
  - Select the correct form length using the Set-up feature.
  - Reset top of form by moving the paper into park position.

- **Paper tears or jams**
  - Examine the paper path; remove any obstacles
  - Is the paper too loose or too tight between the tractors?
  - If the transport holes are deformed at their outer edges, the paper is too taut.
  - If the paper rises between the tractors it is too loose.
  - Readjust the tractor spacing so that the paper lies smoothly but without any tension.
  - Ensure that the paper is horizontally aligned on the pins.
  - Paper moves out of one tractor.

- **Parking paper and resetting top of form**
  - Tear off the paper at the perforation.
  - Press .
  - Press until the paper is in the park position.
  - Press . Printing will resume at the top of the next form.

- **Print head carriage does not move smoothly / does not move at all**
  - Examine the paper path. Remove any obstacles.
  - Examine the carriage area for obstacles. Remove where necessary. Press the key when the paper path is cleared.
  - Make sure that the transport lock has been removed.

- **Single sheets are skewed**
  - Adjust ASF cassette paper guides.
  - You will find more information in chapter **7.2 ASF Cassette**.

6.5 Print-related Problems

- **Print faint or of poor quality**
  - Do you use the right paper? See Chapter **8 Technical Data** which contains the paper specification. Replace the paper if it does not comply to this specification.
  - Does the ribbon need to be changed? Replace it by a new one if necessary.
  - Is the ribbon cassette properly installed?
  - Ribbon path not o.k. ?
  - Print gap incorrect. Press twice.
  - Coppies not dark enough. Don´t use old action paper!

- **Characters are not printed evenly or are not uniform in pitch**
  - Examine the paper path for dirt or other obstacles that may cause the gap between print head and platen to vary. Remove the obstacles.

- **Print lines overlap**
  - Examine the paper path for dirt or other obstacles. Remove the obstacles.

- **Part of printed text is missing (loss of data)**
  - If you are using Serial communication channel check the buffer control setting in Set-up.
  - Check the data flow control setting on the host computer.

If the printout or the character set is not correct the following procedure can help to clear the situation.

Action	Result	Check
Select and start PRINT TEST 1	No print image or printout not complete	S PAPER SOURCE selection S Ribbon condition S Print head condition
Stop SELF TEST and start external printing	No printing starts	S Printer ONLINE READY S Interface cable for proper connection S Interface selection
	Some characters not correct	S Emulation S Character set S National version S Word length S Baud rate S Parity bit S Protocol
	Font and/or pitch faulty	S Font S Pitch S Line space
	Problem still there	S Call service

6.6 Ribbon or Carriage-related Problems

- **Ribbon Problems**
  - Make sure that the ribbon is:
    - Properly tight
    - Not worn out or dry
    - Not torn or damaged in any other way
    - Not jammed
    - Ribbon turned over ?

- **Carriage does not move smoothly**
  - Examine the paper path. Remove any obstacles. Check that all packing material is removed.
  - Examine the carriage area for obstacles. Remove where necessary.

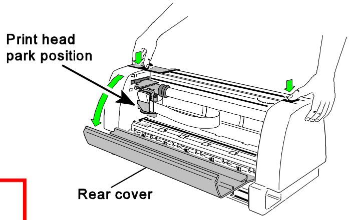
6.7 Print Tests

There are four different print tests as well as one interface test built into the printer.

Note: Detailed information about the print tests you will find in chapter **1.9 Test Printouts**.

6.8 Diagrams for Failure Analysis

6.8.1 Locking Procedure



Error message:

Close rear cover and press (lock key)

LOCAL displayed ?

No →

UNLOCKED -
CHECK RIBBON....

Rear cover closed ?
Ribbon inserted ?
Ribbon movable ?
Print head in park position ?

UNLOCKED -
CARRIAGE ERROR

Open the rear cover, clean the encoder strip and control the position.
Ribbon correctly inserted ?
Is the green lever of the ribbon locked in its home position (right side) ?

UNLOCKED -
CHECK RIBBON ...

Check ribbon cassette and move printhead into park position

UNLOCKED -
GAP ERROR

Open the rear cover
Ribbon correctly inserted ?
Is the green lever of the ribbon locked in its home position (right side) ?
Green lever below the print head ?
Pins of the green ribbon support broken ?

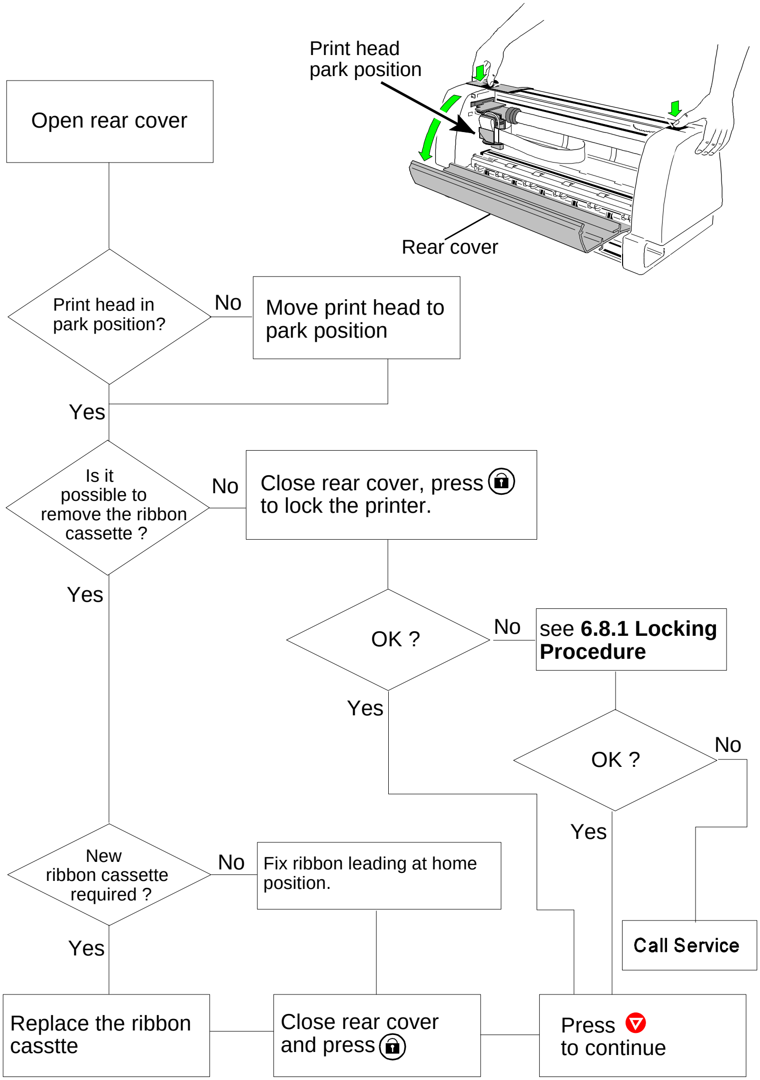
Yes →

Press (down key) to continue

Note: Remove the ribbon cassette only, if the print head is in park position.

6.8.2 Ribbon Unfasten Procedure

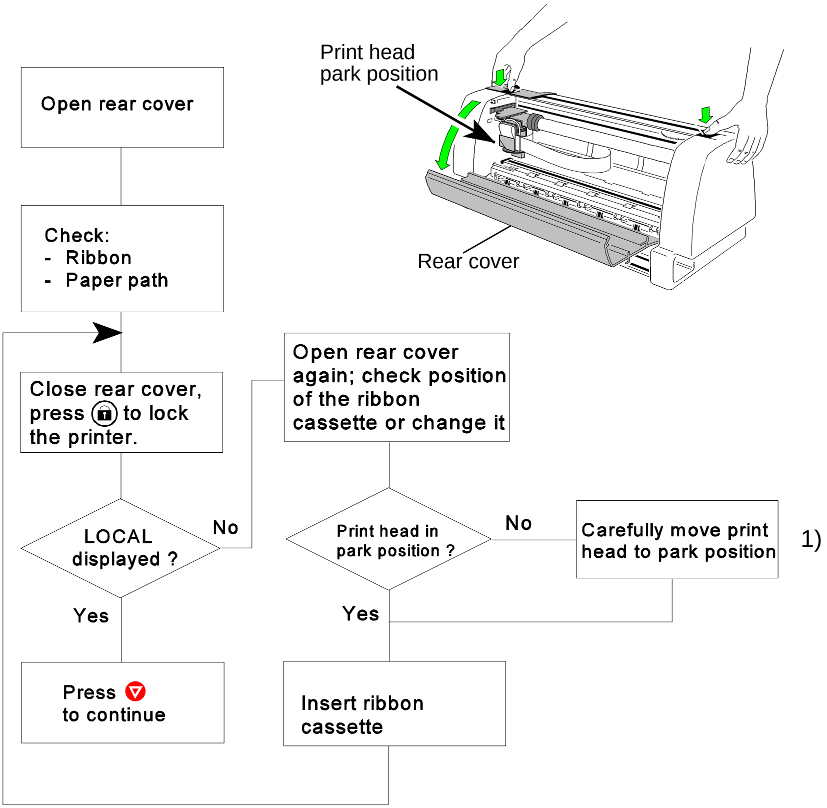
Note: Remove the ribbon cassette only, if the print head is in park position.



6.8.3 RIBBON ERROR

That means, that the printer has tried to tense the ribbon and to fix the ribbon feed guide into the fixing device. But there are still problems with the ribbon.

Note: Remove the ribbon cassette only, if the print head is in park position.



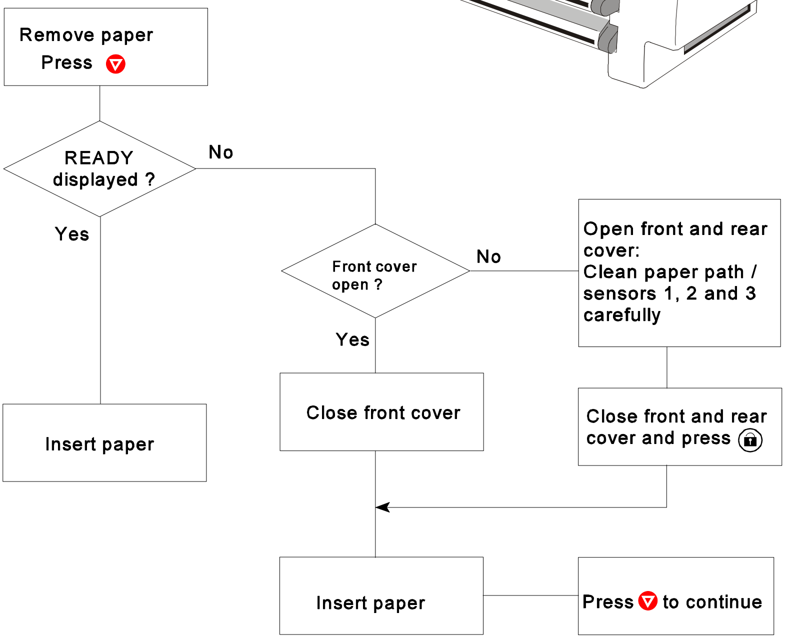
1) Park Postition: Print Head is on the most right side of the printer. (The view is from the front of the printer.)

6.8.4 REMOVE PAPER

That means, that a sensor isn't free from any obstructions:

- Paper remains are in the paper path.
- Front cover isn't closed entirely.
- Sunlight shines directly to a sensor.
- Clean the sensors 1, 2 and 3 carefully.

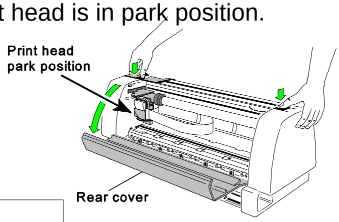


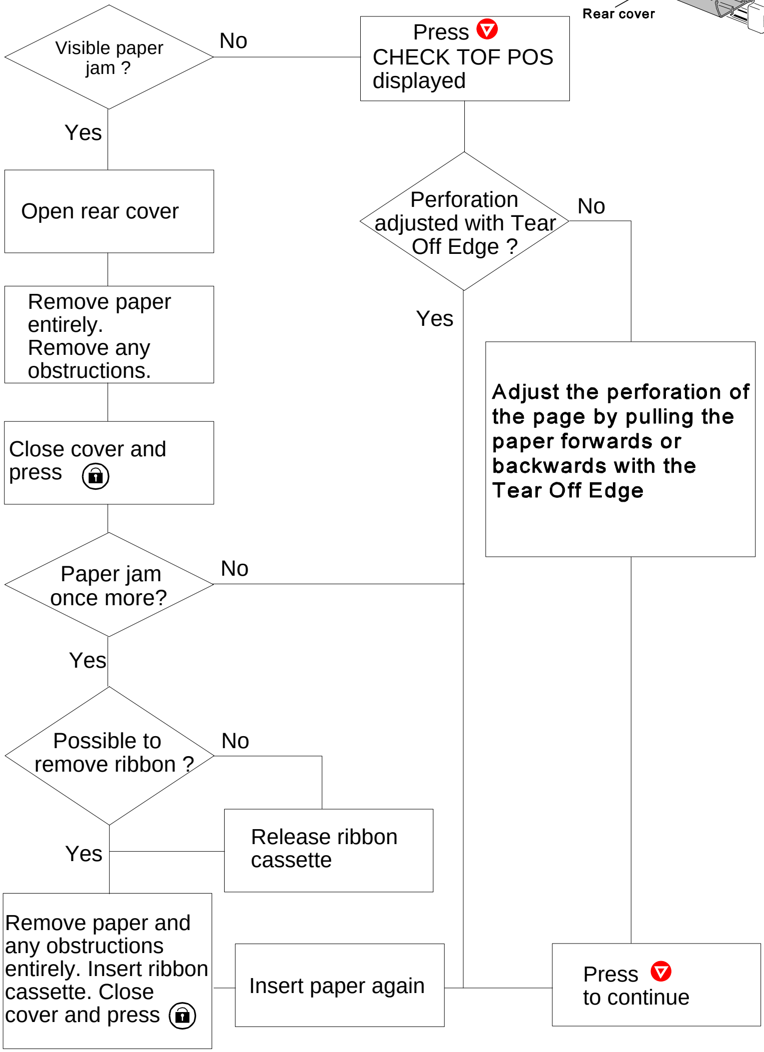


6.8.5 **PAPER JAM TRF** (Tractor Feed)

That means, that there are obstructions in the paper path.

Note: Remove the ribbon cassette only, if the print head is in park position.

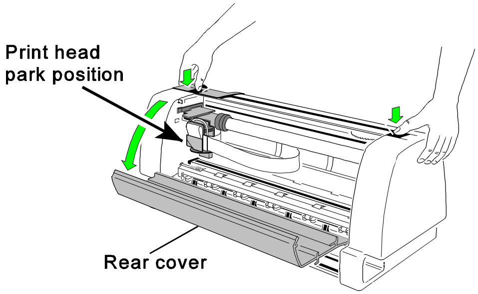


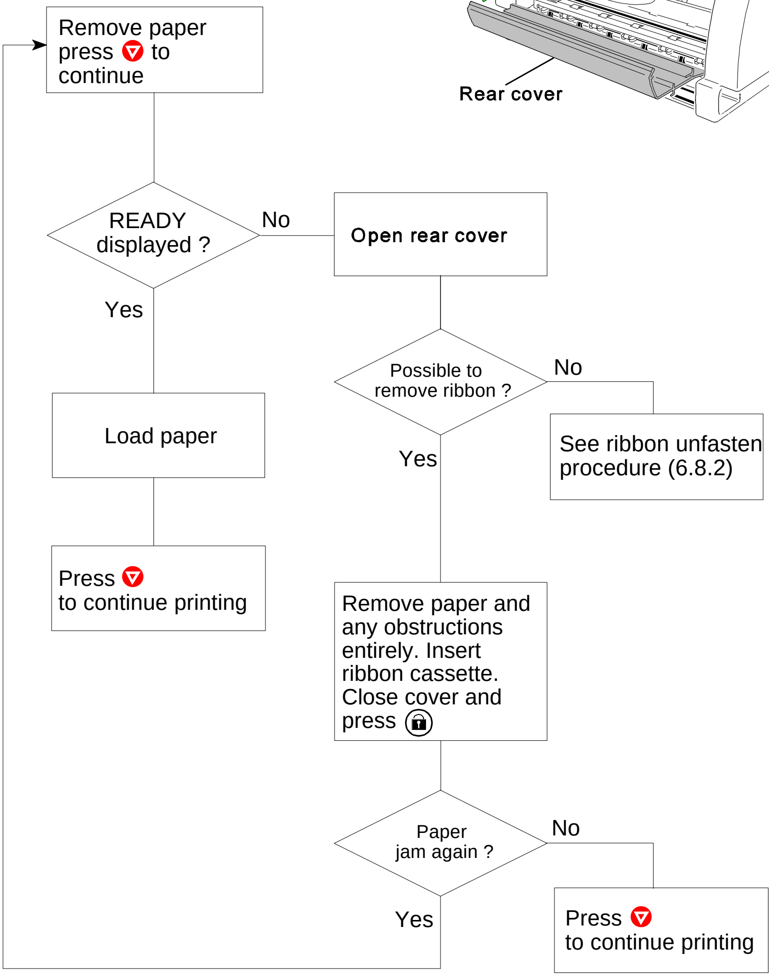


6.8.6 PAPER JAM ASF or MANUAL

That means, that there are obstructions in the paper path.

Note: Remove the ribbon cassette only, if the print head is in park position.

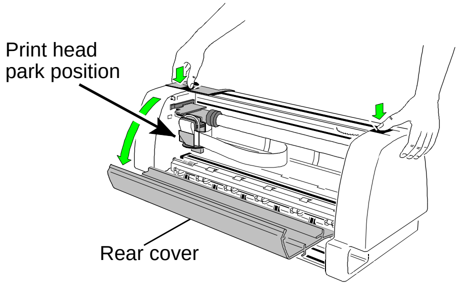




6.8.7 GAP ERROR

That means, that there are obstructions in the paper path.

Note: Remove the ribbon cassette only, if the print head is in park position.



Open rear cover

Possible to remove ribbon ?

No → See ribbon unfasten procedure (6.8.2)

Yes

Remove paper and any obstructions entirely. Insert ribbon cassette. Close cover and press

Press
to continue

Error message again ?

No → Continue printing

Yes

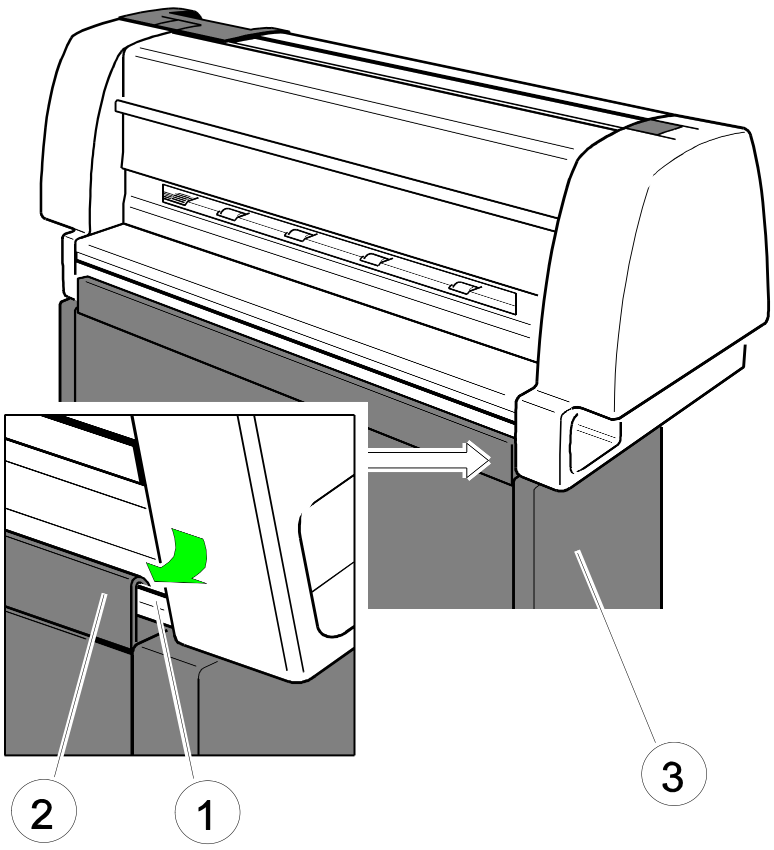
Call service

7. Options

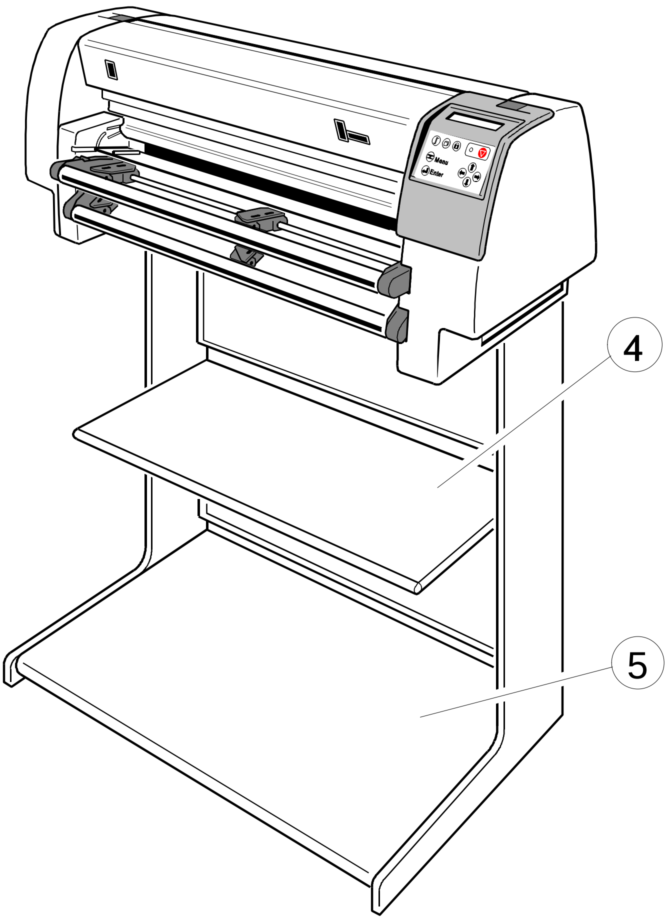
7.1 Printer Stand

Put the printer onto the stand:

S Look at the rear of the printer and put the metal bar (1) underneath the flange-rail (2) of the stand (3).



S The printer is tightly locked with the stand.



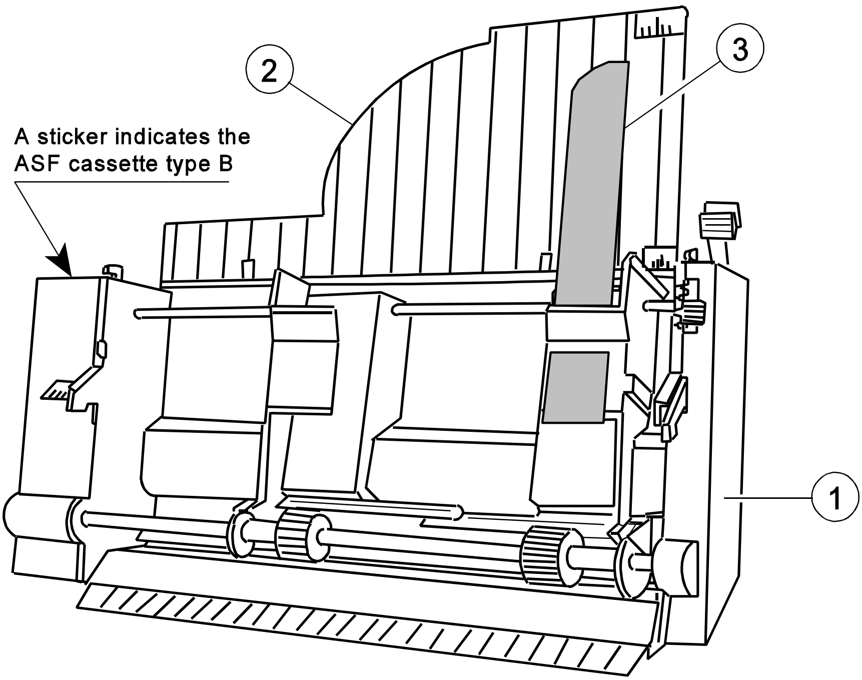
Note: The stand with a shelf for lower tractor (4) and a shelf for upper tractor (5) is an option.

7.2 Automatic Sheet Feeder Cassettes (ASF)

7.2..1 Checking the Delivery Consignment

The printer can be operated with up to three ASF cassettes. The delivery comprises following parts:

- Cassette (1)
- Paper support (2)
- Forms guide (3) (already mounted)

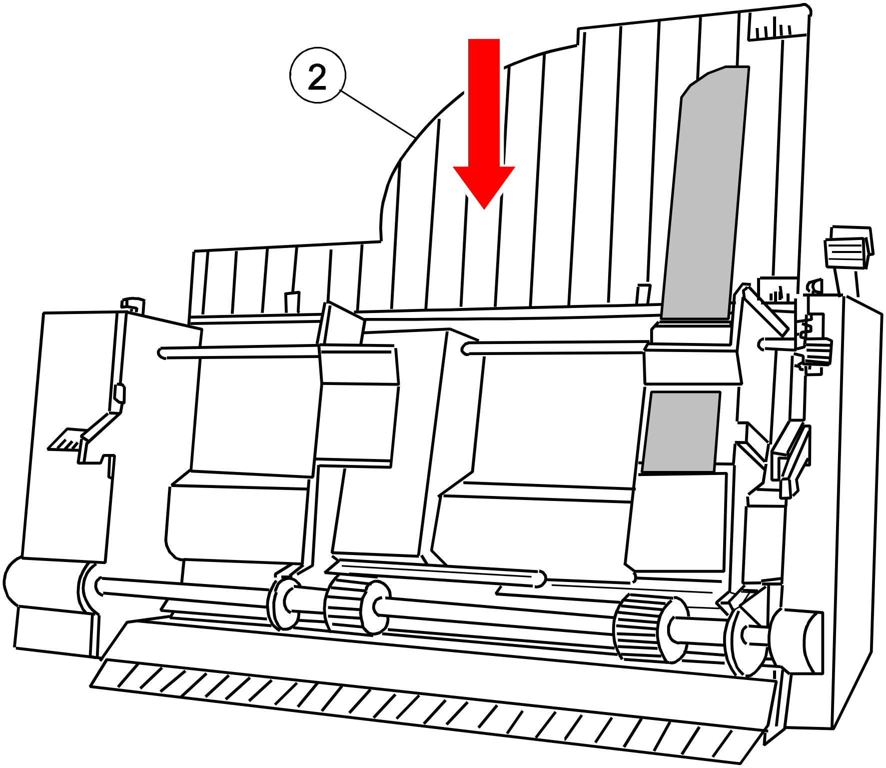


Two different types of ASF cassettes are available.

- Type A for regular paper and form sets
- Type B for thick paper types, heavy form sets, and envelopes
  (A sticker with an envelope indicates the ASF cassette B)

7.2.2 Prepare the ASF Cassettes

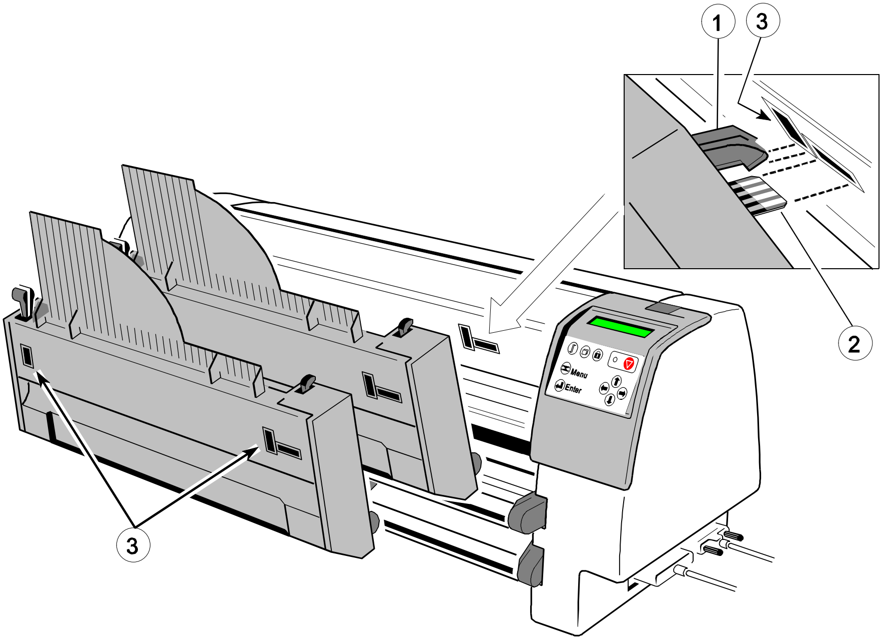
S Mount the paper support (2) onto the cassette.



7.2.3 Installing the ASF Cassettes

- Push the tabs (1) of the cassette into the slots (3) of the printer or of another ASF cassette until they engage.

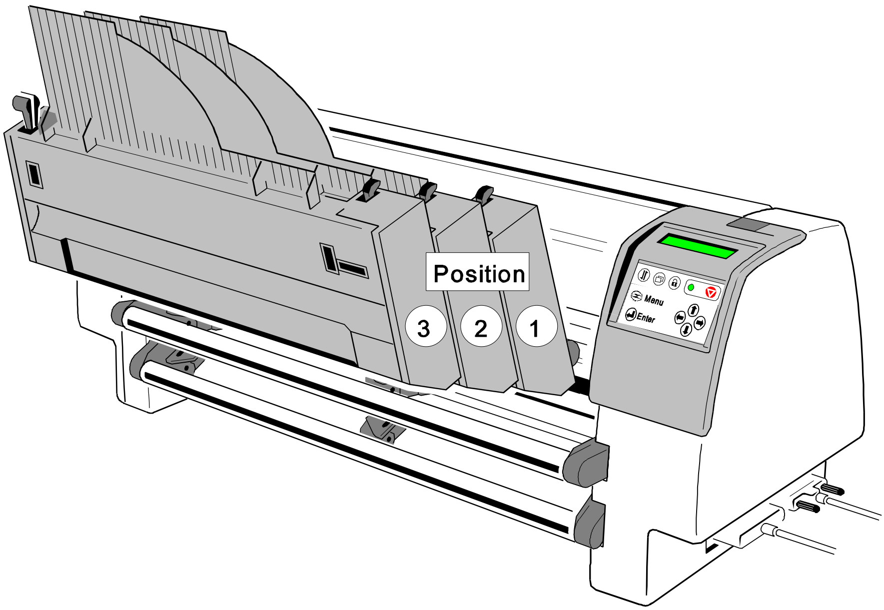
Note:
- Be careful not to damage the contacts (2) of the cassette while installing.
- Up to three ASF cassettes can be installed at any time to enable processing of different paper types and formats simultaneously.



The position of each cassette is dependent on the paper length to be processed. The cassette with the shortest paper needs to be mounted first because the distance between the pick-up rollers of the cassette and the push rollers inside the printer is the shortest at position '1'. For example, if envelopes are to be processed cassette type B needs to be cassette '1'.

Cassette Position	Minimum Paper Length
1 (first mounted)	104 mm (4,08 “)
2	200 mm (7.87 “)
3 (last mounted)	290 mm (11.42 “)

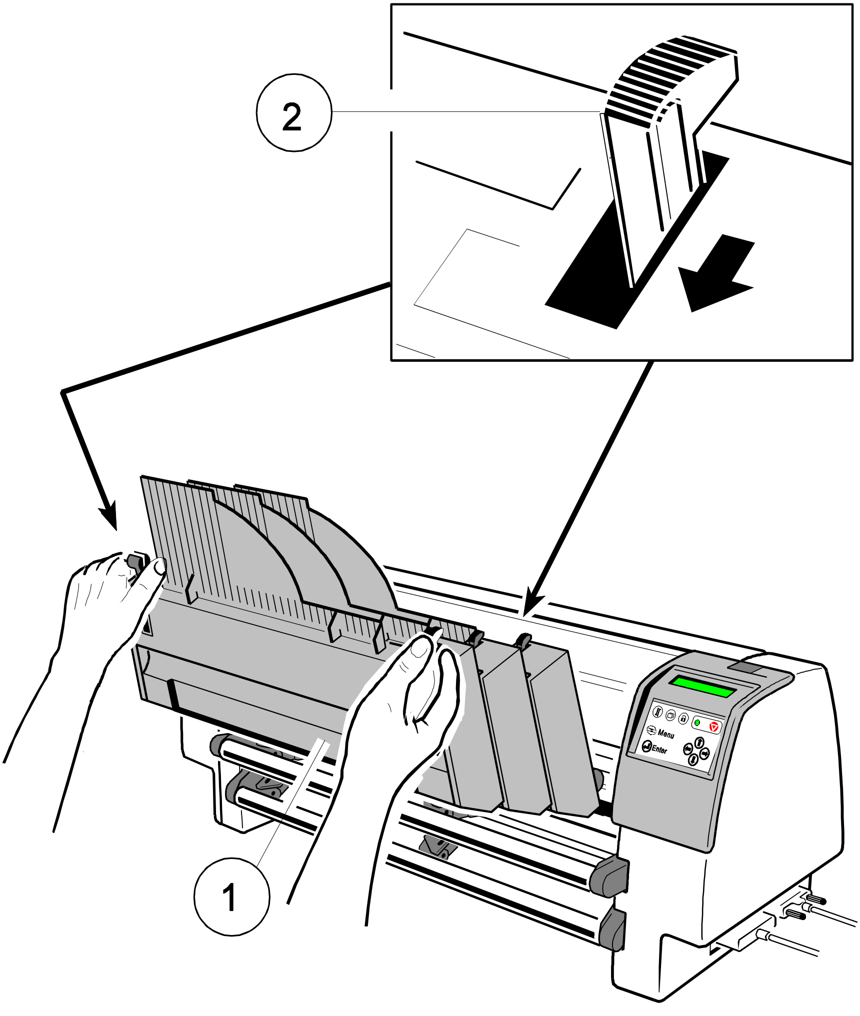
Note: For detail description see chapter **8 Tecnical Data**



7.2.4 Removing the ASF Cassette

Remove the ASF cassette (1) from the printer by drawing back both release levers (2).

Note: To remove all AFS cassettes together release only the ASF cassette in position 1. If the ASF cassettes shall be removed individually so start the removal procedure with the last mounted ASF cassette.



7.2.5 Inserting Paper

The ASF cassette A can be loaded with up to 180 sheets of 80g/m² (21 lb/rearn) paper. Cassette B can be loaded with up to 40 envelopes.
Paper that is intended for use with an ASF cassette must be unpacked and acclimatized within the printer environrnent for at least 24 hours prior to loading.
When loading paper for the first time or changing to another format, the ASF cassette needs to be adapted to the paper size used. This can be done with the ASF attached to the printer.

S Squeeze the ASF cassettes levers (2) together, until the cassette automatically opens its load position.

S If required pull up and release the locking levers (1) and adjust the paper guides (3) to the width of the paper to be loaded.

S Align the left hand edge of the paper with the center marker of the alignment scale (4)

Note: Aligning the edge of the paper with any of the other markers, left or right, will move the margin right or left. Each rnarker represents $^{1}/_{10}$".

S Fix paper guides (3) in position by pushing the levers (1) down.

S Manually fan the paper to separate the individual sheets to remove any static charge.

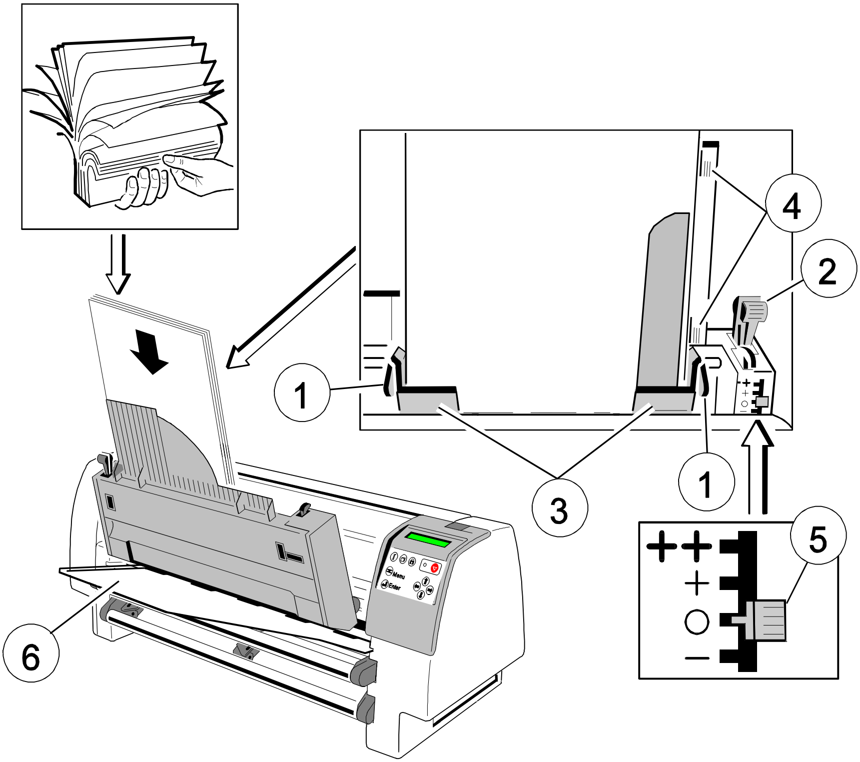
S Insert the paper between the guides.

Note: For 80g/m² (21 ib/ream) paper the paper tension lever (5) should be positioned to 0.

S Pull the ASFcassette lever (2) to return it into the operating position.

S Mount the manual sheet feeder (6) or the cut sheet tray (see paragraph **7.4 Cut Sheet Tray**) for the paper output.

S Select paper source **BIN 1, 2, or 3** (see paragraph **3.5.3 Paper Source**).



Note: Change the pressure off the pick-up rolls by **loosen lever (2)** if paper in use is higher or less than 80 g/m².
Move tension lever (5) towards **-** for lighter and **+** or **++** for heavier paper.

7.3 Replacement of the ASF Pick-up Rollers

The ASF pick-up rollers (1) have an expected life time of approximately 200,000 pages.

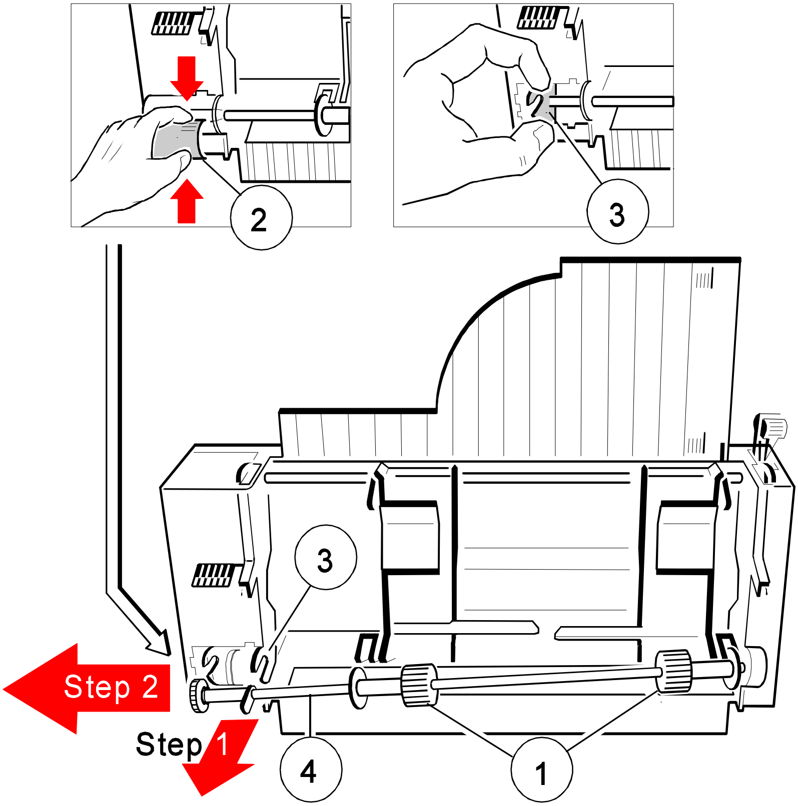
7.3.1 To Remove the ASF Pick-up Rollers (1)

S Remove the ASF cassette (see **7.2.4 Removing the ASF Cassette**).

S Remove the small access cover (2) by squeezing it as shown.

S Pull back the retainers (3) as shown and lift the shaft (4) (step 1).

S Pull the shaft (4) out of the cassette (step 2) and slide the pick-up rollers (1) off the shaft (4).

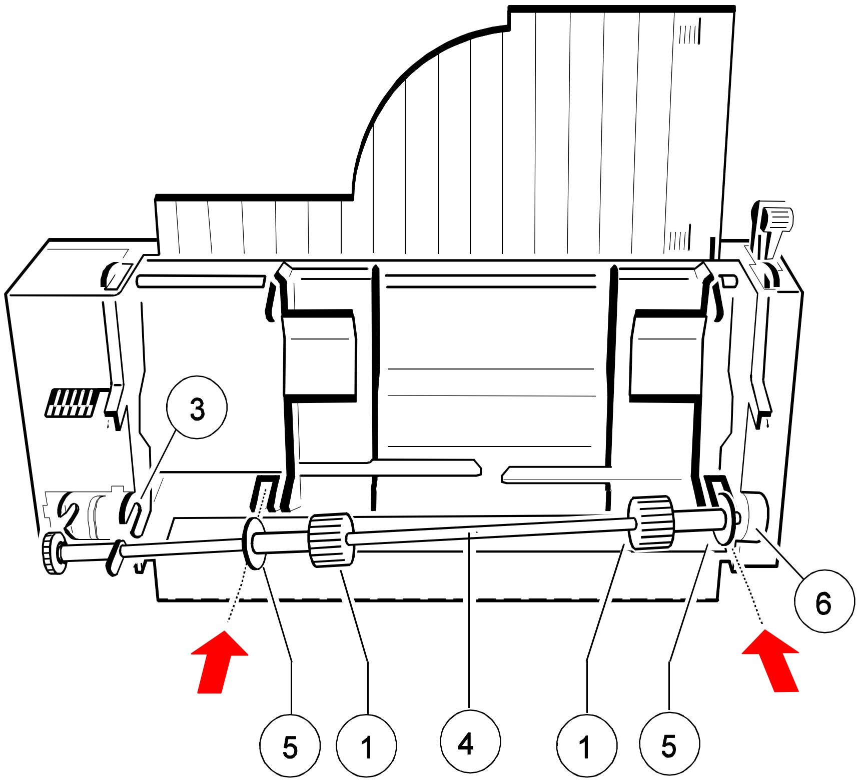


7.3.2 To Install the Pick-up Rollers

- Slide the new pick-up rollers (1) onto the shaft (4).

- Insert the free end of the shaft (4) into the mounting (6), ensuring that each roller flange (5) is positioned so that they join with the indicated slots.

- Carefully snap the shaft (4) into its mounting (3) and fit the small access cover (2).



7.4 Cut Sheet Tray

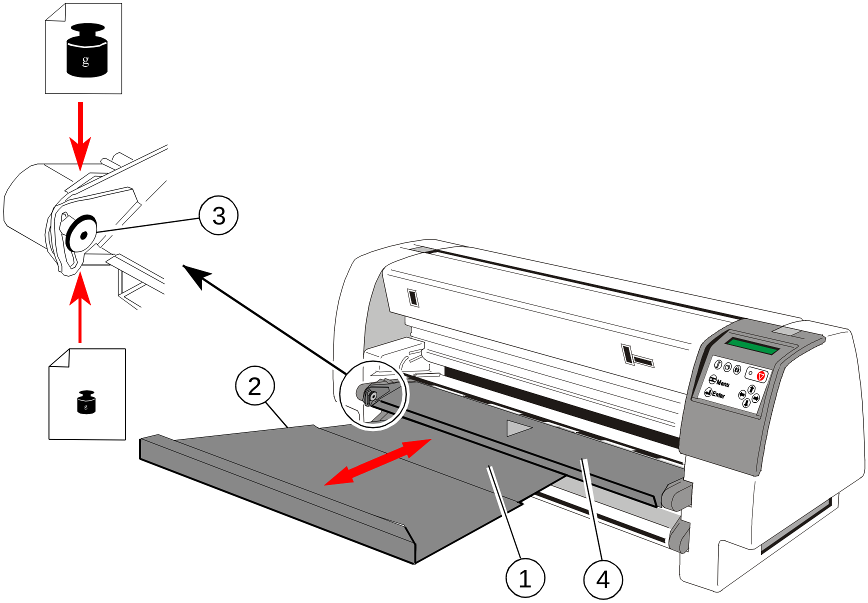
Use the cut sheet tray (1) to collect a batch of paper sheets or formsets in the output area.

7.4.1 Installing the Cut Sheet Tray

- Remove the manual sheet feeder (6).
- Remove the **upper tractor cassette**.
- Insert the cut sheet tray (1) in position of the **upper tractor cassette**.
- Lift the lower part (2) of the cut sheet tray and align it to length of the paper in use.
- To get a correct collection of the sheets or forms loosen screw (3) and swivel the part (4) down for heavy paper (> 80 g/m²) or up for light paper (< 80 g/m²).

  Note: Make a test print and repeat the procedure if necessary.

- Mount the ASF cassettes (see paragraph **7.2.3 Installing the ASF Cassettes**).



8. Technical Data

The standard printer with IBM Proprinter and Epson LQ-2550 emulation is equipped with the PM SER/PAR (Personality Module). It contains a parallel (Centronics®-compatible) and a serial V.24 (RS-232 C) interface.
The following technical data refer to the standard Personality Module PM SER/PAR.

8.1 Printer Specification

Print head technology
Serial Impact Dot Matrix (SIDM) technology.

Print direction
Bidirectional with logic seeking.

Print head
24 needles, needle diameter 0.25 mm (0.01 inch)

Print matrix

- 24 x 36 for letter quality (LQ)
- 12 x 36 for near letter quality (NLQ)
- 12 x 12 for draft (DRAFT)
- 12 x 10 for high speed draft (HS)

Print format
up to165 characters at 10 cpi

Ribbon
Black nylon ribbon for 30 million characters, auto ribbon run control.

Dimensions

- Width = 734 mm
- Depth = 280 mm
- Height= 295 mm

Weight
Approximately 20 kg

Diagnostics
Selftest, 'Hex dump', remote diagnostics via interface.

Operator Panel
16 digit LCD for menu controlled setup, status- and error messages, trilingual (German, English, French).

Rated Voltage
100 - 240 V~ at rated f = 50 - 60 Hz

Power input
< 200 W operating, < 30 W standby

Environmental Temperature
Operating: +10 °C to + 35 °C (+ 50 °F to + 95 °F)
Storage: - 40 °C to + 70 °C (- 40 °F to + 158 °F)

Relative Humidity
operating: 20% - 80%
30% - 70% (when printing on cut sheets)
storage: 5% - 85%

Noise level
<53 dB(A) (operating) acc. to ISO 7779

Agency Approvals
Acc. to VDE / GS, UL, CE, FCC-B

Eml Approvalss
Acc. to regulation of FTZ/FCC, class B

8.2 Performance

Print speed (at 10 cpi)

S	HSD	(High Speed Draft)	720 cps,
S	DRAFT	(Draft Quality)	600 cps,
S	NLQ	(Near Letter Quality)	300 cps,
S	LQ 1	(Letter Quality)	150 cps [1]) ,
S	LQ 2	(Letter Quality)	100 cps [1]) .

1) depending on the selected font

Throughput acc. to ECMA-132

Standard Letter (Dr. Grauert)

S Draft Quality: 580 pages/h

S Letter Quality: 260 pages/h

Workload

30.000 pages per month

MTBF

10,000 h at 30% duty cycle

8.3 Paper Handling

Integrated push tractor with park position for continuous paper, zero tear off, manual front insertion.
Paper width max 16.6". Automatic Paper(form set)- and envelope feeder with up to three selectable cassettes for max. A4 / Letter format.

Paper path

Flat bed technology.

S transportable form thickness max 2.0 mm

Automatic Gap Control (AGC)

The Automatic Gap Control (AGC) optimizes automatically the print gap according to paper thickness.

Copies

S 1 original + 6 copies (max. form thickness 0.5 mm [0.02 inch]).

S 1 original without any copy by a form thickness of max. 1.0 mm

8.3.1 Tractor Feed

Continuous forms (1 original plus 6 copies) suitable for tractor feed:

- **Feeding:** 2 removable tractor cassettes
- **Output:** rear side

	minimum	maximum
Paper width:	100 mm (4")	420 mm (17.7")
Paper length:	63 mm (2,5")	14"
Paper weight:		
1-ply	60 g/m²	120 g/m²
multiply (per sheet)	40 g/m²	
total set		350 g/m²
total paper / form thickness		0.5 mm (0.02")
Paper movement:		21 inch/sec

8.3.2 Manual Insertion

Print media suitable for manual insertion:

	minimum	maximum
Paper width:	100 mm	420 mm
Paper length:	63 mm	315 mm
Paper weight:		
Cut sheets	70 g/m²	260 g/m²
Form set of action paper		
first sheet	70 g/m²	
other sheets	40 g/m²	
last sheet	70 g/m²	
total set		350 g/m²
Total paper/form thickness		
printing		0.5 mm (0.02")
transport		2.0 mm

8.4 Connectivity

Interface

- Parallel Centronics® (IEEE 1284 compatibility mode and nibble mode)
- Serial RS-232/RS-422 shared operation

Emulations

- EPSON® LQ 1060/2550 / ESC/P2
- IBM® Proprinter XL24 (AGM)

Buffer

- Up to 64 kByte.

Character Sets (see also Appendix B "Character Set Tables")

- Code Pages **EE**: 437 GK, 851 GK, 928 GK, 855 CYRI, 852, 866, 869, Kamenicky, ISO Latin 2, Mazovia, 437 HUN, 852 SEE, 866 LAT, WIN LAT 2.
- Code Pages **EE2**: 771, 773, 774, 775, Baltic RIM.
- ISO 8859/15
- ISO 8859/1
- IBM SET 1+ 2 incl. 14 national versions.
- IBM Code Pages 437, 850, 858, 860, 863, 865.
- Epson Ext. Graphic Character Set incl. 15 national versions.

Fonts

- DRAFT: Data, HSP; and Data Large.
- Near letter and letter quality: Roman, San Serif, Courier, Prestige, Script, Orator-C, and Orator.
- Letter quality: OCR B, OCR A.

Character Attributes

Bold, *italic*, shadow, outline, double strike, underline, double underline, overline, strike through, sub/superscript.

Size

double to octuple for all fonts, Data Large 99-fold size.

Character Pitch

Standard character pitches are: 10, 12, 15, 17.1, 18, 20 cpi and proportional. In addition, commands are defined to select non-standard character pitches. It is also possible to print overlapped characters. Fonts will be compressed if smaller pitches are selected.

Line Spacing

2, 3, 4, 6, 8, 12 ... 360 lpi

Barcodes

Code 39, 2 of 5 industrial, 2 of 5 interleaved, Codabar (Monarch), EAN 8, EAN 13, Code 93, MSI Mod 10/10, UPC-E, UPC-A, Code 128 (incl. EAN 128), Postnet and KIX Code (see also Appendix G Barcode Quick Reference).

Graphics

Max. resolution (V x H). 180 x 360 dpi: Single pass
360 x 360 dpi: Double pass.

Graphics Quality

Selectable are: Standard, Win.LQ 180 dpi, Win.NLQ 90 dpi, or Win.Draft 60 dpi

Note: Printer drivers for Windows 3.x, 95, 98, NT 4.0 are available. (See **CD-ROM**).

8.5 Options

8.5.1 Printer Stand

Provides the optimum work station convenience.

- **Width**: 635 mm
- **Depth**: 660 mm
- **Height**: 840 mm
- **Weight**: approx. 20 kg

8.5.2 Automatic Sheet Feeder

Suitable for automatic insertion of cut sheets and thin form sets (Cassette A) or for thick and inflexible sheets, not interrupted top-glued forms, and envelopes (Cassette B).

Automatic Sheet Feeder Cassette A

	minimum	**maximum**
Paper width:	105 mm (4.13")	305 mm (12")
Paper length:	105 mm (4.13")	315 mm (12.4")

The minimum paper length for all cassettes depends on the mounting position of the cassette as the feeding path of the paper is the longest in the last mounted cassette.

Paper Length	**minimum**	**maximum**
Cassette 1 (first mounted)	104 mm (4.09")	315 mm (12.4")
Cassette 2	200 mm (7.87")	315 mm (12.4")
Cassette 3 (last mounted)	290 mm (11.42")	315 mm (12.4")

Paper weight

Cut sheets	70 g/m² (18 lb/ream)	100 g/m² (26 lb/ream)
- **Form sets** of action paper		260 g/m² (69 lb/ream)
Weight of the first and last sheet	70 g/m² (18 lb/ream)	80 g/m² (20 lb/ream)
Total thickness of set		0.35 mm (0.014")

Note: The first and last page of the form set must have a weight between 70 and 80 g/m²; the top-glued area must end 20 mm from the left and right margins.

Capacity: 180 sheets of 80 g/m² (21 lb/ream) paper weight.

8.5.3 Automatic Sheet Feeder with Cassette B

	minimum	maximum
Paper width:	105 mm (4.13")	305 mm (12")

The minimum paper length for cassette B depends on the mounting position of the cassette as the feeding path of the paper is the longest in the last mounted cassette.

Paper Length	**minimum**	**maximum**
Cassette 1 (first mounted)	104 mm (4.09")	315 mm (12.4")
Cassette 2	200 mm (7.87")	315 mm (12.4")
Cassette 3 (last mounted)	290 mm (11.42")	315 mm (12.4")
Paper weight		
S **Cut sheets**	100g/m² (26 lb/ream)	150g/m² (40 lb/ream)

Appropriate direction of the fibre and flexibility for automatic feeding required.

- S **Form sets** of action paper — 300g/m² (80 lb/ream)
  - S Weight of first / last page — 70 / 80g/m² (18/21 lb/ream)
  - S Total thickness of set — 0.5mm (0.02")

Note: The form sets for cassette B must not have a horizontal perforation or carbon paper; the top-glued area must not have any margins as required for cassette A.

- S **Envelopes** unlined, adhesive flap covered — 70g/m² (18 lb/ream) — 90g/m² (24 lb/ream)
  - S **Capacity**: 40 envelopes of 70g/m² (18 lb/ream) paper weight

Appendix A System Interface Description

There are two system interfaces:

- one serial interface with RS-232C or RS-422 support
- one Parallel Centronics interface.

The interfaces can be operated in three different modes:

- parallel interface active
- parallel interface active in shared mode with serial RS-232C
- parallel interface active in shared mode with serial RS-422

The following chapter gives an overview about interface characteristics, control signals, protocols, and cabling.

Any change to the operation mode (PARALLEL, PARALL. / RS232, or PARALL. / RS422) and to the size of the interface buffer is only possible when the interface buffer is completely empty of data.

1. Serial Interface RS-232C / RS-422

1.1 Interface Characteristics

Signal Description RS-232C		Pin No.	Direction
PG	Protective Ground	1	-
TXD	Transmit Data (from printer to host)	2	OUTPUT
RXD	Receive Data (from host to printer)	3	INPUT
RTS	Request to Send (printer is requesting data transfer from host)	4	OUTPUT
CTS	Clear to Send (host is ready to receive data from printer)	5	INPUT
DSR	Data Set Ready (host is requesting data transfer from printer, can not be used for flow control, internaly set to "1")	6	INPUT
SG	Signal Ground	7	-
DTR	Data Terminal Ready (printer is ready to receive - see also on the following pages the data communication protocols for detail meaning	20	OUTPUT

Signal Description RS-422		Pin No.	Direction
PG	Protective Ground	1	-
RDA	Receive Data (from host to printer)	3	INPUT
SDA	Send Data (from printer to host)	9	OUTPUT
SDB	Not Send Data (from printer to host)	10	OUTPUT
RDB	Not Receive Data (from host to printer)	18	INPUT

- Transmission rate: 600, 1200, 2400, 4800, 9600, 19200, or 38400 baud
- Parity: even, odd, or none
- Word length: 7, or 8 bits
- Number of stop bits: In receive mode the printer accepts 1, or 2 stop bits. The printer transmits always two bits.

Transmission Protocols:

- DTR - Ready/Busy (only RS-232C)
- XON/XOFF
- XON/XOFF + DTR (only RS-232C)

1.2 Transmission Protocols and Connection Diagrams

1.2.1 DTR - Ready/Busy

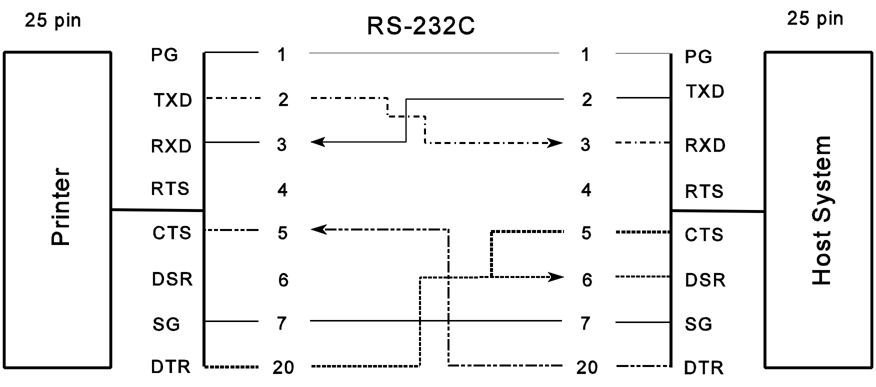
(Supported RS-232C Protocols) - Full Duplex Local Connection

This protocol uses the following signal lines:

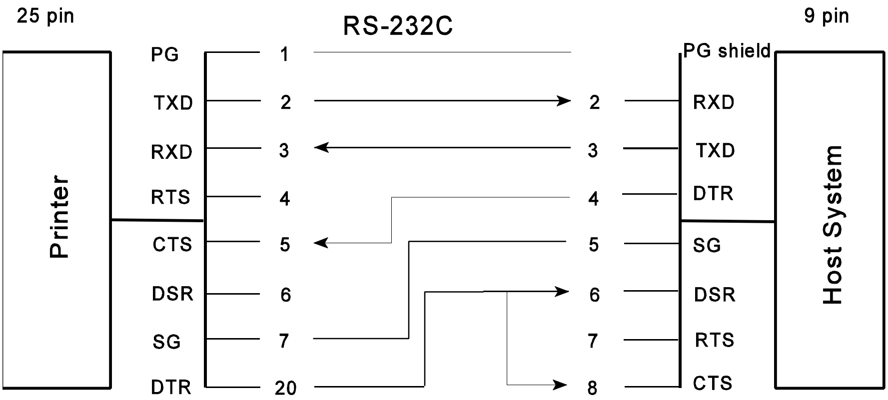
- Pin 1 Protective Ground (PG)
- 2 Transmit Data (TXD)
- 3 Receive Data (RXD)
- 5 Clear to Send (CTS)
- 7 Signal Ground (SG)
- 20 Data Terminal Ready (DTR)

Note: The signal lines TXD (pin 2) and CTS (pin 5) are only necessary if the Device Status Report is required.

The READY / BUSY DTR protocol uses the DATA TERMINAL READY (DTR) line to control the transmission of data from the host to prevent a buffer overflow.



Note: Printer DTR may be connected to host DSR + CTS or only to host DSR and a bridge between RTS and CTS.



Note: Printer DTR may be connected to host DSR + CTS or only to host DSR and a bridge between RTS and CTS.

Additional Information

After Power-ON DTR is activated and the printer is ready to receive data.

DTR is deactivated when the interface buffer has only space left for 256 more characters. Further incoming data will be stored until the interface buffer is full. All data sent in addition will get lost. DTR is activated again if there is a free interface buffer space of 512 characters.

DTR is immediately deactivated, if local mode is entered.

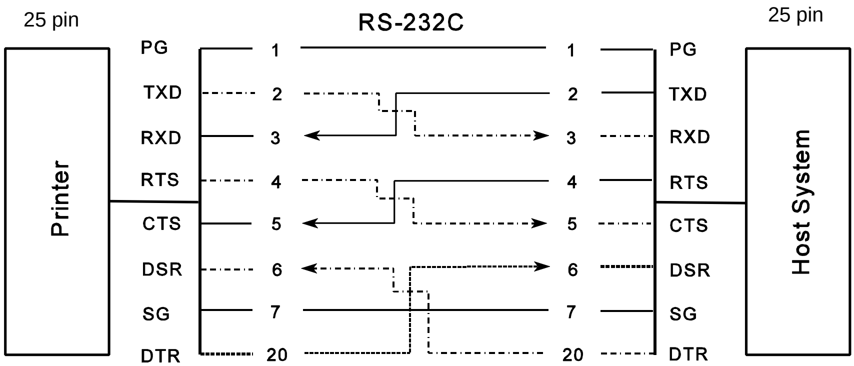
It is activated again, if local mode is left and a minimum of 512 bytes interface buffer is available.

1.2.2 XON / XOFF

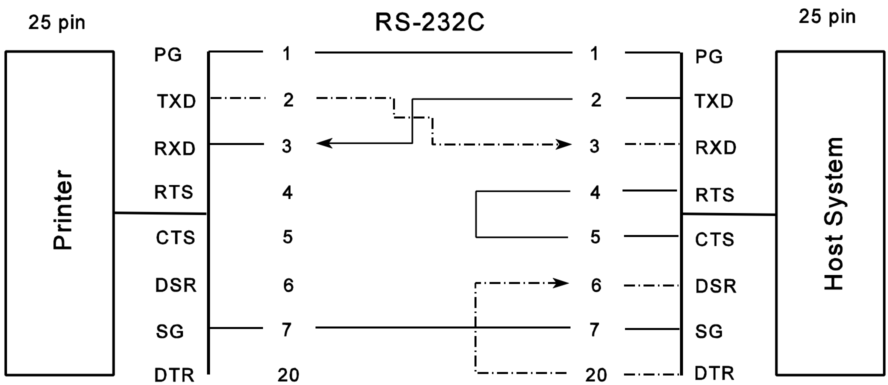
This protocol requires all signal lines.

- Pin 1 Protective Ground (PG)
- 2 Transmit Data (TXD)
- 3 Receive Data (RXD)
- 4 Request to Send (RTS)
- 5 Clear to Send (CTS)
- 6 Data Set Ready (DSR)
- 7 Signal Ground (SG)
- 20 Data Terminal Ready (DTR)

Standard Connection



For local connections **RTS** with **CTS** can be connected and likewise **DTR** with **DSR**.



Additional Information to XON / XOFF

After Power-ON DTR and RTS are activated and the printer is ready to receive data.

XOFF is sent, when the interface buffer has only space left for 256 more characters. **XOFF** is sent again, at a level of 128 characters buffer space. Further incoming data will be stored until the interface buffer is full. All data sent in addition will get lost.

XON is sent when the interface buffer provides space for a minimum of 512 characters.

XON/XOFF can only be sent successfully when **CTS** is at active state.
When the CTS Mode is set to "CTS ignore" CTS is allways in the active state.

XOFF will be sent immediately if local mode is entered.

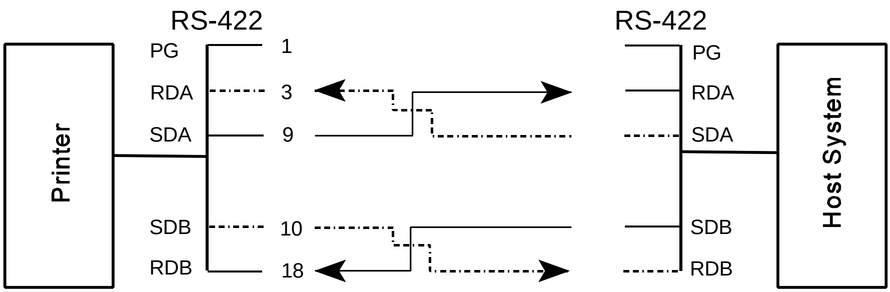
XON is sent again, if local mode is left and a minimum of 512 byte interface buffer is available.

1.2.3 Serial Interface with RS-422

This interface typ requires the signal lines.

- Pin 1 Protective Ground (PG)
- 3 Receive Data (RDA)
- 9 Send Data (SDA)
- 10 Not Send Data (SDB)
- 18 Not Receive Data (RDB)

Standard Connection



Note: Protective ground (PG) connected either to host **or** printer

2. Parallel Centronics® Interface

2.1 Interface Characteristics - Connector Pin Assignment / Signal Definition

Signal Description		Pin No.	Return line Pin No.	Direction
$\overline{\text{STROBE}}$ *)	Control Signal from the Host. Printer reads data line (Data 1 to Data 8) when going low.	1	19	Input
Data 1 - 8	Data lines transfer the characters from the host to the printer. Data 8 = most significant bit.	2 - 9	20 - 27	Input
$\overline{\text{ACKN}}$ *)	Acknowledge - Negative going pulse from the printer indicates that the printer has received a character and is ready for the next data transfer.	10	28	Output
BUSY	Control signal from the printer. A high level indicates that the printer is unable to receive any more data.**)	11	29	Output
PE	Paper Empty - Control signal from the printer. This signal goes high when paper runs out, i.e. load upper or lower tractor, paper jam.	12	--	Output
SELECT	Control signal from the printer. A high level indicates that the printer is **ON-LINE** and ready.	13	--	Output
LG	Logic Ground	14	--	
--	not used	15	--	
LG	Logic Ground	16	--	
CG	Chassis Ground	17	--	
VCC	+ 5 volt	18	--	
SG	Signal Ground	19 - 20	--	
$\overline{\text{INIT}}$ *)	Control signal from the host. Does not reset the printer.	31	--	Input
$\overline{\text{FAULT}}$ *)	Control signal from the printer. A low level indicates that the printer has been switched off, or the serial interface is active.	32	--	Output
LG	Logic Ground	33	--	
--	not used	34 - 35	--	
$\overline{\text{SELECT IN}}$	Compatible mode (low) 1284 nibble mode (high)	36	30	Input

*) Overlined signal names indicate that the signal is true when the signal level is low.

) When the interface buffer is full except for the last character, **BUSY will not be reset. **BUSY** will be reset when buffer space is available again for least 512 characters in the interface buffer. While the printer is offline (Stop Mode), or **BUSY** remains active until the printer enters the online state again.

IEEE Std 1284 Nibble mode including Device ID are supported.
The maximum throughput for data transfer is 42,000 characters per second.

2.2 Transmission Protocol Description

After Power-ON the **PE** (Paper Empty) signal is set to low level and the **SELECT** and $\overline{\textbf{FAULT}}$ signals are set to high level.

The printer is now **ON-LINE** and ready to receive data.

Timing
The host sets a print/control character to the 8 data lines.

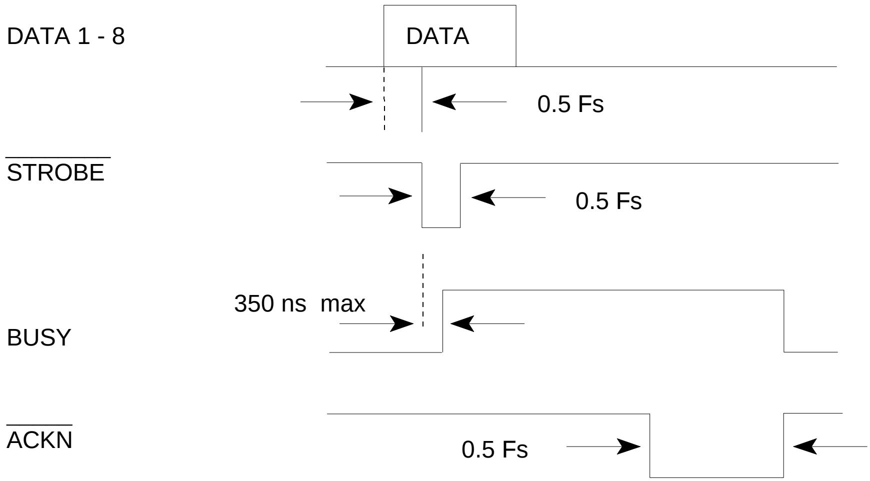
After a time delay of a minimum of 0.5 µs, the host sends a $\overline{\textbf{STROBE}}$ pulse of a minimum of 0.5 µs. When the data byte is accepted into the interface buffer the printer transmits a **BUSY** signal and an $\overline{\textbf{ACKN}}$ pulse.

The $\overline{\textbf{ACKN}}$ pulse informs the host that the data has been received and that the printer is ready to receive new data.

If the interface buffer is full except for the last character the **BUSY** is not reset in order to stop the data transfer from the host. The **BUSY** signal is only reset if space is available in the interface buffer for a minimum of 512 characters.

While the printer is offline, or a serial interface is active **BUSY** remains high and no $\overline{\textbf{ACKN}}$ is sent until the printer enters online state or the serial interface is deselected.

2.3 Timing Diagram



3. Shared Operation

In shared operation the interface buffer capacity is reduced by 256 bytes.

After Power-ON both the serial and the parallel interfaces are available for data transfer.

If a byte is first recognized by the serial interface the parallel interface is immediately disabled by the **BUSY** signal. The serial interface is now active and will operate, using the installed protocols.

If a byte is first recognized by the parallel interface either the **DTR** signal of the serial interface is set to **OFF** or **XOFF** is sent, depending on the protocol.

If the serial interface starts to receive data while the parallel interface is active, it is possible to receive 256 bytes of serial data. Any additional serial data will be lost.

When the interface buffer is completely empty of serial data, and no new data has been received by the serial interface for more than 10 seconds, both interfaces are available for data transfer again.

When the interface buffer is completely empty of parallel data and no data has been received by the parallel interface for more than 60 seconds, the 256 bytes of serial data will be processed. Afterwards, both interfaces are available for data transfer again.

Appendix B Print Samples of Resident Fonts

The Printer with the Personality Module (PM SER/PAR) provides the following resident fonts:

DATA

§ !"#$%&'()*+,-./0123456789:;<=>?§ABCDEFGH
_`abcdefghijklmnopqrstuvwxyzäöüß Çüéâäàåçê
fáíóúñÑªº¿⌐¬½¼¡«»░▒▓│┤╡╢╖╕╣║╗╝╜╛┐ └┴┬├─┼╞╟╚
▓αßΓπΣσµτΦΘΩδ∞φε∩≡±≥≤⌠⌡÷≈°∙·√^{n} ^{2}■

ROMAN NLQ

§ !"#$%&'()*+,-./0123456789:;<=>?§ABCDEFGH
_`abcdefghijklmnopqrstuvwxyzäöüß Çüéâäàåçê
fáíóúñÑªº¿⌐¬½¼¡«»░▒▓│┤╡╢╖╕╣║╗╝╜╛┐ └┴┬├─┼╞╟╚
▓αßΓπΣσµτΦΘΩδ∞φε∩≡±≥≤⌠⌡÷≈°∙·√^{n} ^{2}■

ROMAN LQ

§ !"#$%&'()*+,-./0123456789:;<=>?§ABCDEFGH
_`abcdefghijklmnopqrstuvwxyzäöüß Çüéâäàåçê
fáíóúñÑªº¿⌐¬½¼¡«»░▒▓│┤╡╢╖╕╣║╗╝╜╛┐ └┴┬├─┼╞╟╚
■αßΓπΣσµτΦΘΩδ∞φε∩≡±≥≤⌠⌡÷≈°∙·√^{n} ^{2}■

SAN SERIF NLQ

§ !"#$%&'()*+,-./0123456789:;<=>?§ABCDEFGH
_'abcdefghijklmnopqrstuvwxyzäöüß Çüéâäàåçê
fáíóúñÑªº¿⌐¬½¼¡«»░▒▓│┤╡╢╖╕╣║╗╝╜╛┐ └┴┬├─┼╞╟╚
▓αßΓπΣσµτΦΘΩδ∞φε∩≡±≥≤⌠⌡÷≈°∙·√^{n} ^{2}■

SAN SERIF LQ

§ !"#$%&'()*+,-./0123456789:;<=>?§ABCDEFGH
_'abcdefghijklmnopqrstuvwxyzäöüß Çüéâäàåçê
fáíóúñÑªº¿⌐¬½¼¡«»░▒▓│┤╡╢╖╕╣║╗╝╜╛┐ └┴┬├─┼╞╟╚
■αßΓπΣσµτΦΘΩδ∞φε∩≡±≥≤⌠⌡÷≈°∙·√^{n} ^{2}■

COURIER NLQ

§ !"#$%&'()*+,-./0123456789:;<=>?§ABCDEFGH
_`abcdefghijklmnopqrstuvwxyzäöüß Çüéâäàåçê
ƒáíóúñÑªº¿⌐¬½¼¡«»░▒▓│┤╡╢╖╕╣║╗╝╜╛┐└┴┬├─┼╞╟╚
▓αβΓπΣσµτΦΘΩδ∞øε∩≡±≥≤⌠⌡÷≈°•·√^{n} ^{2} ■

COURIER LQ

§ !"#$%&'()*+,-./0123456789:;<=>?§ABCDEFGH
_`abcdefghijklmnopqrstuvwxyzäöüß Çüéâäàåçê
ƒáíóúñÑªº¿⌐¬½¼¡«»░▒▓│┤╡╢╖╕╣║╗╝╜╛┐└┴┬├─┼╞╟╚
▓αβΓπΣσµτΦΘΩδ∞øε∩≡±≥≤⌠⌡÷≈°•·√^{n} ^{2} ■

PRESTIGE NLQ

§ !"#$%&'()*+,-./0123456789:;<=>?§ABCDEFGH
_`abcdefghijklmnopqrstuvwxyzäöüß Çüéâäàåçê
ƒáíóúñÑªº¿⌐¬½¼¡«»░▒▓│┤╡╢╖╕╣║╗╝╜╛┐└┴┬├─┼╞╟╚
▓αβΓπΣσµτΦΘΩδ∞øε∩≡±≥≤⌠⌡÷≈°•·√^{n} ^{2} ■

PRESTIGE LQ

§ !"#$%&'()*+,-./0123456789:;<=>?§ABCDEFGH
_`abcdefghijklmnopqrstuvwxyzäöüß Çüéâäàåçê
ƒáíóúñÑªº¿⌐¬½¼¡«»░▒▓│┤╡╢╖╕╣║╗╝╜╛┐└┴┬├─┼╞╟╚
▓αβΓπΣσµτΦΘΩδ∞øε∩≡±≥≤⌠⌡÷≈°•·√^{n} ^{2} ■

```
SCRIPT          NLQ
§ !"#$%&'()*+,-./0123456789:;<=>?§ABCDEFGH
_`abcdefghijklmnopqrstuvwxyzäöüß Çüéâäàåç
ƒáíóúñÑªº¿⌐¬½¼¡«»░▒▓│┤╡╢╖╕╣║╗╝╜╛┐ └┴┬├─┼╞╟
▓αßΓπΣσµτΦΘΩδ∞φε∩≡±≥≤⌠⌡÷≈°∙·√ⁿ²■
```

```
SCRIPT          LQ
§ !"#$%&'()*+,-./0123456789:;<=>?§ABCDEFGH
_`abcdefghijklmnopqrstuvwxyzäöüß Çüéâäàåç
ƒáíóúñÑªº¿⌐¬½¼¡«»░▒▓│┤╡╢╖╕╣║╗╝╜╛┐ └┴┬├─┼╞╟
■αßΓπΣσµτΦΘΩδ∞φε∩≡±≥≤⌠⌡÷≈°∙·√ⁿ²■
```

```
OCR B           LQ
§ !"#$%&'()*+,-./0123456789:;<=>?§ABCDEFGI
_`abcdefghijklmnopqrstuvwxyzäöüß Çüéâäàåç
ƒáíóúñÑªº¿⌐¬½¼¡«»░▒▓│┤╡╢╖╕╣║╗╝╜╛┐ └┴┬├─┼╞╟
■αßΓπΣσµτΦΘΩδ∞φε∩≡±≥≤⌠⌡÷≈°∙·√ⁿ²■
```

```
OCR A           LQ
§ !"#$%&'()*+,-./0123456789:;<=>?§ABCDEFGI
_`abcdefghijklmnopqrstuvwxyzäöüß Çüéâäàåç
ƒáíóúñÑªº¿⌐¬½¼¡«»░▒▓│┤╡╢╖╕╣║╗╝╜╛┐ └┴┬├─┼╞╟
■αßΓπΣσµτΦΘΩδ∞φε∩≡±≥≤⌠⌡÷≈°∙·√ⁿ²■
```

ORATOR-C NLQ
§ !"#$%&'()*+,-./0123456789:;<=>?§ABCDEFGH
_`ABCDEFGHIJKLMNOPQRSTUVWXYZÄÖÜß ÇÜÉÂÄÀÅÇÊ
ƒÁÍÓÚÑÑªº¿⌐¬½¼¡«»░▒▓│┤╡╢╖╕╣║╗╝╜╛┐└┴┬├─┼╞╟
▓αßΓπΣσµτΦΘΩδ∞øε∩≡±≥≤⌠⌡÷≈°∙·√^{n}^{2}■

ORATOR-C LQ
§ !"#$%&'()*+,-./0123456789:;<=>?§ABCDEFGH
_`ABCDEFGHIJKLMNOPQRSTUVWXYZÄÖÜß ÇÜÉÂÄÀÅÇÊ
ƒÁÍÓÚÑÑªº¿⌐¬½¼¡«»░▒▓│┤╡╢╖╕╣║╗╝╜╛┐└┴┬├─┼╞╟
█αßΓπΣσµτΦΘΩδ∞øε∩≡±≥≤⌠⌡÷≈°∙·√^{n}^{2}■

ORATOR NLQ
§ !"#$%&'()*+,-./0123456789:;<=>?§ABCDEFGH
_`abcdefghijklmnopqrstuvwxyzäöüß Çüéâäàåçê
ƒáíóúñÑªº¿⌐¬½¼¡«»░▒▓│┤╡╢╖╕╣║╗╝╜╛┐└┴┬├─┼╞╟
▓αßΓπΣσµτΦΘΩδ∞øε∩≡±≥≤⌠⌡÷≈°∙·√^{n}^{2}■

ORATOR LQ
§ !"#$%&'()*+,-./0123456789:;<=>?§ABCDEFGH
_`abcdefghijklmnopqrstuvwxyzäöüß Çüéâäàåçê
ƒáíóúñÑªº¿⌐¬½¼¡«»░▒▓│┤╡╢╖╕╣║╗╝╜╛┐└┴┬├─┼╞╟
█αßΓπΣσµτΦΘΩδ∞øε∩≡±≥≤⌠⌡÷≈°∙·√^{n}^{2}■

DATA LARGE

§ !"#$%&'()

/0123456789

?§ABCDEFGHI

OPQRSTUVWXY

_`abcdefghi

opqrstuvwxy

Çüéâäàåçêë

ÅÉæÆôöòÛùÿÖ

ƒáíóúñÑªº¿⌐

Character Pitches

COURIER LQ, 20 CPI   0123456789ABCDEF

COURIER LQ, 18 CPI   0123456789ABCDEF

COURIER LQ, 17 CPI 0123456789ABCDEF

COURIER LQ, 15 CPI   0123456789ABCDEF

COURIER LQ, 12 CPI   0123456789ABCDEF

COURIER LQ, 10 CPI   0123456789ABC

COURIER LQ, proport. 0123456789ABCDEF

COURIER outline

1234567890ß,#+!"|$%&/()=?;'*
ABCDEFGHIJKLMNOPQRSTUVWXYZÄÖÜ
abcdefghijklmnopqrstuvwxyzäöü

COURIER shadow

1234567890ß,#+!"|$%&/()=?;'*
ABCDEFGHIJKLMNOPQRSTUVWXYZÄÖÜ
abcdefghijklmnopqrstuvwxyzäöü

COURIER outline + shadow

1234567890ß,#+!"|$%&/()=?;'*
ABCDEFGHIJKLMNOPQRSTUVWXYZÄÖÜ
abcdefghijklmnopqrstuvwxyzäöü

COURIER
4xHeight 4xWidth outline

123ABCabc

COURIER
4xHeight 4xWidth shadow

123ABCabc

COURIER
4xHeight 4xWidth shadow + outline

123ABCabc

COURIER LQ, 10 CPI

0123456789ABCDEF

COURIER LQ, 1x HEIGHT 2x WIDTH

0123456789ABCDEF

COURIER LQ, 1x HEIGHT 3x WIDTH

01234ABCDEF

COURIER LQ, 1x HEIGHT 4x WIDTH

01234ABC

COURIER LQ, 1x HEIGHT 4x WIDTH, BOLD

01234ABC

COURIER LQ, 2x HEIGHT 1x WIDTH

0123456789ABCDEF

COURIER LQ, 3x HEIGHT 1x WIDTH

0123456789ABCDEF

COURIER LQ, 4x HEIGHT 1x WIDTH

0123456789ABCDEF

COURIER LQ, 4x HEIGHT 1x WIDTH, BOLD

0123456789ABCDEF

COURIER LQ, 2x HEIGHT 2x WIDTH

0123456789ABCDEF

COURIER LQ, 3x HEIGHT 3x WIDTH

01234ABCDEF

COURIER LQ, 4x HEIGHT 4x WIDTH

01234ABC

COURIER LQ, 4x HEIGHT 4x WIDTH, BOLD

01234ABC

Appendix C Character Set Tables

1.1 Code Table ISO 8859-1

	2	3	4	5	6	7		A	B	C	D	E	F
0		0	@	P	`	p			E	À	Ð	à	ð
1	!	1	A	Q	a	q		¡	±	Á	Ñ	á	ñ
2	"	2	B	R	b	r		¢	^{2}	Â	Ò	â	ò
3	#	3	C	S	c	s		£	^{3}	Ã	Ó	ã	ó
4	$	4	D	T	d	t		¤	'	Ä	Ô	ä	ô
5	%	5	E	U	e	u		¥	F	Å	Õ	å	õ
6	&	6	F	V	f	v		|	¶	Æ	Ö	æ	ö
7	*	7	G	W	g	w		§	!	Ç	×	ç	÷
8	(	8	H	X	h	x		¨	¸	È	Ø	è	ø
9	)	9	I	Y	i	y		©	^{1}	É	Ù	é	ù
A	*	:	J	Z	j	z		ª	º	Ê	Ú	ê	ú
B	+	;	K	[	k	{		*	+	Ë	Û	ë	û
C	´	<	L	\	l	|		¬	¼	Ì	Ü	ì	ü
D	-	=	M	]	m	}		–	½	Í	Ý	í	ý
E	.	>	N	^	n	~		®	¾	Î	Þ	î	þ
F	/	?	O	_	o			G	¿	Ï	ß	ï	ÿ

1.2 Code Table ISO 8859-15

	2	3	4	5	6	7		A	B	C	D	E	F
0		0	@	P	`	p			E	À	Đ	à	ð
1	!	1	A	Q	a	q		¡	±	Á	Ñ	á	ñ
2	"	2	B	R	b	r		¢	^{2}	Â	Ò	â	ò
3	#	3	C	S	c	s		£	^{3}	Ã	Ó	ã	ó
4	$	4	D	T	d	t		€	ð	Ä	Ô	ä	ô
5	%	5	E	U	e	u		¥	F	Å		å	õ
6	&	6	F	V	f	v		Š	¶	Æ	Ö	æ	ö
7	*	7	G	W	g	w		§	**!**	Ç	×	ç	÷
8	(	8	H	X	h	x		š	ñ	È	Ø	è	ø
9	)	9	I	Y	i	y		©	^{1}	É	Ù	é	ù
A	*	:	J	Z	j	z		a	o	Ê	Ú	ê	ú
B	+	;	K	[	k	{		*****	**+**	Ë	Û	ë	û
C	´	<	L	\	l	|		¬	Œ	Ì	Ü	ì	ü
D	-	=	M	]	m	}		–	œ	Í	Ý	í	ý
E	.	>	N	^	n	~		®	Ÿ	Î	Þ	î	þ
F	/	?	O	_	o			G	¿	Ï	ß	ï	ÿ

2 Code Table IBM All Character Set

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	i	<	SP	0	@	P	`	p	Ç	É	á	!	.	J	"	/
1	(	=	!	1	A	Q	a	q	ü	æ	í	"	2	L	$	±
2	)	;	"	2	B	R	b	r	é	Æ	ó	#	0	H	'	$
3	Ì	.	#	3	C	S	c	s	â	ô	ú	*	/	F	B	#
4	Ë	¶	$	4	D	T	d	t	ä	ö	ñ	1	)	B	E	!
5	Ê	§	%	5	E	U	e	u	à	ò	Ñ	I	3	?	F	"
6	Í	_	&	6	F	V	f	v	å	û	ª	M	G	C	µ	÷
7	!	0	*	7	G	W	g	w	ç	ù	º	D	K	O	J	.
8	3	8	(	8	H	X	h	x	ê	ÿ	¿	@	9	P	M	E
9	"	9	)	9	I	Y	i	y	ë	Ö	1	<	6	-	1	@
A	4	6	*	:	J	Z	j	z	è	Ü	¬	5	=	+	S	·
B	%	7	+	;	K	[	k	{	ï	¢	½	7	;	$	*	%
C	&	2	´	<	L	\	l	|	î	£	¼	8	:	(	4	6
D	*	:	-	=	M	]	m	}	ì	¥	¡	E	4	%	ø	²
E	+	>	.	>	N	^	n	~	Ä	.	*	A	>	'	,	#
F	'	?	/	?	O	_	o		Å	ƒ	+	,	N	&	1	SP

Applicable for Code Table IBM Set 1 and 2

3 Code Table IBM Set 1

National Version = USA

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL		SP	0	@	P	`	p	NUL		á	!	.	J	"	/
1		DC1	!	1	A	Q	a	q		DC1	í	"	2	L	$	±
2		DC2	"	2	B	R	b	r		DC2	ó	#	0	H	'	$
3		DC3	#	3	C	S	c	s		DC3	ú	*	/	F	B	#
4		DC4	$	4	D	T	d	t		DC4	ñ	1	)	B	E	!
5			%	5	E	U	e	u			Ñ	I	3	?	F	"
6			&	6	F	V	f	v			ª	M	G	C	µ	÷
7	BEL		*	7	G	W	g	w	BEL		º	D	K	O	J	.
8	BS	CAN	(	8	H	X	h	x	BS	CAN	¿	@	9	P	M	E
9	HT		)	9	I	Y	i	y	HT		1	<	6	-	1	@
A	LF		*	:	J	Z	j	z	LF		¬	5	=	+	S	·
B	VT	ESC	+	;	K	[	k	{	VT	ESC	½	7	;	$	*	%
C	FF		´	<	L	\	l	|	FF		¼	8	:	(	4	6
D	CR		-	=	M	]	m	}	CR		¡	E	4	%	ø	²
E	SO		.	>	N	^	n	~	SO		*	A	>	'	,	#
F	SI		/	?	O	_	o		SI		+	,	N	&	1	SP

3.1 National Version IBM Set 1

<table>
<tr><th rowspan="2"></th><th colspan="12">Character Code (Hex)</th></tr>
<tr><th>23</th><th>24</th><th>40</th><th>5B</th><th>5C</th><th>5D</th><th>5E</th><th>60</th><th>7B</th><th>7C</th><th>7D</th><th>7E</th></tr>
<tr><td>1: USA</td><td>#</td><td>$</td><td>@</td><td>[</td><td>\</td><td>]</td><td>^</td><td>`</td><td>{</td><td>|</td><td>}</td><td>~</td></tr>
<tr><td>2: FRANCE</td><td>#</td><td>$</td><td>à</td><td>E</td><td>ç</td><td>§</td><td>^</td><td>`</td><td>é</td><td>ù</td><td>è</td><td>¨</td></tr>
<tr><td>3: GERMANY</td><td>#</td><td>$</td><td>§</td><td>Ä</td><td>Ö</td><td>Ü</td><td>^</td><td>`</td><td>ä</td><td>ö</td><td>ü</td><td>ß</td></tr>
<tr><td>4: U.K.</td><td>£</td><td>$</td><td>@</td><td>[</td><td>\</td><td>]</td><td>^</td><td>`</td><td>{</td><td>|</td><td>}</td><td>~</td></tr>
<tr><td>5: DENMARK</td><td>#</td><td>$</td><td>@</td><td>Æ</td><td>Ø</td><td>Å</td><td>^</td><td>`</td><td>æ</td><td>ø</td><td>å</td><td>~</td></tr>
<tr><td>6: SWEDEN</td><td>#</td><td>¤</td><td>É</td><td>Ä</td><td>Ö</td><td>Å</td><td>Ü</td><td>é</td><td>ä</td><td>ö</td><td>å</td><td>ü</td></tr>
<tr><td>7: ITALY</td><td>#</td><td>$</td><td>@</td><td>E</td><td>\</td><td>é</td><td>^</td><td>ù</td><td>à</td><td>ò</td><td>è</td><td>ì</td></tr>
<tr><td>8: SPAIN</td><td>.</td><td>$</td><td>@</td><td>¡</td><td>Ñ</td><td>¿</td><td>^</td><td>`</td><td>¨</td><td>ñ</td><td>}</td><td>~</td></tr>
<tr><td>9: JAPAN</td><td>#</td><td>$</td><td>@</td><td>[</td><td>¥</td><td>]</td><td>^</td><td>`</td><td>{</td><td>|</td><td>}</td><td>~</td></tr>
<tr><td>10: NORWAY</td><td>#</td><td>¤</td><td>É</td><td>Æ</td><td>Ø</td><td>Å</td><td>Ü</td><td>é</td><td>æ</td><td>ø</td><td>å</td><td>ü</td></tr>
<tr><td>11: DENMARK 2</td><td>#</td><td>$</td><td>É</td><td>Æ</td><td>Ø</td><td>Å</td><td>Ü</td><td>é</td><td>æ</td><td>ø</td><td>å</td><td>ü</td></tr>
<tr><td>12: SPAIN 2</td><td>#</td><td>$</td><td>á</td><td>¡</td><td>Ñ</td><td>¿</td><td>é</td><td>`</td><td>í</td><td>ñ</td><td>ó</td><td>ú</td></tr>
<tr><td>13: LATIN AM.</td><td>#</td><td>$</td><td>á</td><td>¡</td><td>Ñ</td><td>¿</td><td>é</td><td>Ü</td><td>í</td><td>ñ</td><td>ó</td><td>ú</td></tr>
<tr><td>14: TURKEY</td><td>#</td><td>§</td><td>¦</td><td>Ç</td><td>Ö</td><td>Ô</td><td>Ü</td><td>™</td><td>ç</td><td>ö</td><td>Õ</td><td>ü</td></tr>
</table>

4 Code Table IBM Set 2

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL		SP	0	@	P	`	p	Ç	É	á	!	.	J	a	/
1		DC1	!	1	A	Q	a	q	ü	æ	í	"	2	L	ß	±
2		DC2	"	2	B	R	b	r	é	Æ	ó	#	0	H	G	$
3	Ì	DC3	#	3	C	S	c	s	â	ô	ú	*	/	F	p	#
4	Ë	DC4	$	4	D	T	d	t	ä	ö	ñ	1	)	B	S	!
5	Ê	§	%	5	E	U	e	u	à	ò	Ñ	I	3	?	s	"
6	Í		&	6	F	V	f	v	å	û	ª	M	G	C	µ	÷
7	BEL		*	7	G	W	g	w	ç	ù	º	D	K	O	t	.
8	BS	CAN	(	8	H	X	h	x	ê	ÿ	¿	@	9	P	F	E
9	HT		)	9	I	Y	i	y	ë	Ö	1	<	6	-	T	@
A	LF		*	:	J	Z	j	z	è	Ü	¬	5	=	+	O	·
B	VT	ESC	+	;	K	[	k	{	ï	¢	½	7	;	$	d	%
C	FF		´	<	L	\	l	|	î	£	¼	8	:	(	4	6
D	CR		-	=	M	]	m	}	ì	¥	¡	E	4	%	ø	²
E	SO		.	>	N	^	n	~	Ä	.	*	A	>	'	e	#
F	SI		/	?	O	_	o		Å	ƒ	+	,	N	&	1	SP

4.1 National Version IBM Set 2

	Character Code (Hex)													
	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E	9B	9D
1: USA	#	$	@	[	\	]	^	`	{	|	}	~	¢	¥
2: FRANCE	#	$	à	E	ç	§	^	`	é	ù	è	¨	¢	¥
3: GERMANY	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß	¢	¥
4: U.K.	£	$	@	[	\	]	^	`	{	|	}	~	¢	¥
5: DENMARK	#	$	@	[	\	]	^	`	{	|	}	~	ø	Ø
6: SWEDEN	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü	¢	¥
7: ITALY	#	$	@	E	\	é	^	ù	à	ò	è	ì	¢	¥
8: SPAIN	.	$	@	¡	Ñ	¿	^	`	¨	ñ	}	~	¢	¥
9: JAPAN	#	$	@	[	¥	]	^	`	{	|	}	~	¢	¥
10: NORWAY	#	$	@	[	\	]	^	`	{	|	}	~	ø	Ø
11: DEMARK 2	#	$	@	[	\	]	^	`	{	|	}	~	ø	Ø
12: SPAIN 2	#	$	á	¡	Ñ	¿	é	`	í	ñ	ó	ú	¢	¥
13: LATIN AM.	#	$	á	¡	Ñ	¿	é	Ü	í	ñ	ó	ú	¢	¥
14: TURKEY	#	§	¦	Ç	Ö	Ô	Ü	™	ç	ö	Õ	ü	¢	¥

5 Code Table IBM Code Page

Code Page	Countries
1: Code Page 437	USA
2: Code Page 850	Germany, U.K., Denmark, Sweden, Italy, Spain, Japan, Latin Am., Turkey
3: Code Page 858	Germany, U.K., Denmark, Sweden, Italy, Spain, Japan, Latin Am., Turkey inc. EURO Symbol (€)
4: Code Page 860	Portugal
5: Code Page 863	France
6: Code Page 865	Norway

5.1 IBM Code Page 437

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	i	<	SP	0	@	P	`	p	Ç	É	á	!	.	J	a	/
1	(	=	!	1	A	Q	a	q	ü	æ	í	"	2	L	ß	±
2	)	;	"	2	B	R	b	r	é	Æ	ó	#	0	H	G	$
3	Ì	.	#	3	C	S	c	s	â	ô	ú	*	/	F	p	#
4	Ë	¶	$	4	D	T	d	t	ä	ö	ñ	1	)	B	S	!
5	Ê	§	%	5	E	U	e	u	à	ò	Ñ	I	3	?	s	"
6	Í	_	&	6	F	V	f	v	å	û	ª	M	G	C	µ	÷
7	!	0	*	7	G	W	g	w	ç	ù	º	D	K	O	t	.
8	3	8	(	8	H	X	h	x	ê	ÿ	¿	@	9	P	F	E
9	"	9	)	9	I	Y	i	y	ë	Ö	1	<	6	-	T	@
A	4	6	*	:	J	Z	j	z	è	Ü	¬	5	=	+	O	·
B	%	7	+	;	K	[	k	{	ï	¢	½	7	;	$	d	%
C	&	2	´	<	L	\	l	|	î	£	¼	8	:	(	4	6
D	*	:	-	=	M	]	m	}	ì	¥	¡	E	4	%	ø	²
E	+	>	.	>	N	^	n	~	Ä	.	*	A	>	'	e	#
F	'	?	/	?	O	_	o		Å	ƒ	+	,	N	&	1	SP

5.2 IBM Code Page 850

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	i	<	SP	0	@	P	`	p	Ç	É	á	!	.	ð	Ó	-
1	(	=	!	1	A	Q	a	q	ü	æ	í	"	2	Đ	ß	±
2	)	;	"	2	B	R	b	r	é	Æ	ó	#	0	Ê	Ô	=
3	Ì	.	#	3	C	S	c	s	â	ô	ú	*	/	Ë	Ò	¾
4	Ë	¶	$	4	D	T	d	t	ä	ö	ñ	1	)	È	õ	¶
5	Ê	§	%	5	E	U	e	u	à	ò	Ñ	Á	3	§	Õ	§
6	Í	_	&	6	F	V	f	v	å	û	ª	Â	ã	¦	µ	÷
7	!	0	*	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	¸
8	3	8	(	8	H	X	h	x	ê	ÿ	¿	©	9	Ï	Þ	?
9	"	9	)	9	I	Y	i	y	ë	Ö	®	<	6	-	Ú	¨
A	4	6	*	:	J	Z	j	z	è	Ü	¬	5	=	+	Û	<
B	%	7	+	;	K	[	k	{	ï	ø	½	7	;	$	Ù	¹
C	&	2	´	<	L	\	l	|	î	£	¼	8	:	(	ý	³
D	*	:	-	=	M	]	m	}	ì	Ø	¡	¢	4	|	Ý	²
E	+	>	.	>	N	^	n	~	Ä	×	*	¥	>	ì	¯	#
F	'	?	/	?	O	_	o		Å	ƒ	+	,	¤	&	'	SP

5.3 IBM Code Page 858

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	i	<	SP	0	@	P	`	p	Ç	É	á	!	.	ð	Ó	-
1	**(**	=	!	1	A	Q	a	q	ü	æ	í	"	2	Đ	$	±
2	**)**	;	"	2	B	R	b	r	é	Æ	ó	#	0	Ê	Ô	=
3	**Ì**	**.**	#	3	C	S	c	s	â	ô	ú	*	/	Ë	Ò	¾
4	**Ë**	¶	$	4	D	T	d	t	ä	ö	ñ	1	)	È	õ	¶
5	**Ê**	§	%	5	E	U	e	u	à	ò	Ñ	Á	3	€	Õ	§
6	**Í**	_	&	6	F	V	f	v	å	û	ª	Â	ã	¦	µ	÷
7	**!**	**0**	*	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	¸
8	**3**	8	(	8	H	X	h	x	ê	ÿ	¿	©	9	Ï	Þ	4
9	**"**	9	)	9	I	Y	i	y	ë	Ö	®	<	6	-	Ú	¨
A	**4**	6	*	:	J	Z	j	z	è	Ü	¬	5	=	+	Û	<
B	**%**	7	+	;	K	[	k	{	ï	ø	½	7	;	$	Ù	¹
C	**&**	**2**	´	<	L	\	l	|	î	£	¼	8	:	(	ý	³
D	*****	:	-	=	M	]	m	}	ì	Ø	¡	¢	4	|	Ý	²
E	**+**	>	.	>	N	^	n	~	Ä	×	*****	¥	>	ì	¯	**#**
F	**'**	?	/	?	O	_	o		Å	ƒ	**+**	,	¤	&	'	SP

5.4 IBM Code Page 860

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	i	<	SP	0	@	P	`	p	Ç	É	á	!	.	J	"	/
1	(	=	!	1	A	Q	a	q	ü	À	í	"	2	L	$	±
2	)	;	"	2	B	R	b	r	é	È	ó	#	0	H	'	$
3	Ì	.	#	3	C	S	c	s	â	ô	ú	*	/	F	B	#
4	Ë	¶	$	4	D	T	d	t	ã	õ	ñ	1	)	B	E	!
5	Ê	§	%	5	E	U	e	u	à	ò	Ñ	I	3	?	F	"
6	Í	_	&	6	F	V	f	v	Á	Ú	ª	M	G	C	µ	÷
7	!	0	*	7	G	W	g	w	ç	ù	º	D	K	O	J	.
8	3	8	(	8	H	X	h	x	ê	Ì	¿	@	9	P	M	E
9	"	9	)	9	I	Y	i	y	Ê	Õ	Ò	<	6	-	1	@
A	4	6	*	:	J	Z	j	z	è	Ü	¬	5	=	+	S	·
B	%	7	+	;	K	[	k	{	ï	¢	½	7	;	$	*	%
C	&	2	´	<	L	\	l	|	î	£	¼	8	:	(	4	6
D	*	:	-	=	M	]	m	}	ì	Ù	¡	E	4	%	ø	²
E	+	>	.	>	N	^	n	~	Ã	.	*	A	>	'	,	#
F	'	?	/	?	O	_	o		Å	Ó	+	,	N	&	1	SP

5.5 IBM Code Page 863

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	i	<	SP	0	@	P	`	p	Ç	É	|	!	.	J	"	/
1	(	=	!	1	A	Q	a	q	ü	È	'	"	2	L	$	±
2	)	;	"	2	B	R	b	r	é	Ê	ó	#	0	H	'	$
3	Ì	.	#	3	C	S	c	s	â	ô	ú	*	/	F	B	#
4	Ë	¶	$	4	D	T	d	t	Â	Ë	¨	1	)	B	E	!
5	Ê	§	%	5	E	U	e	u	à	Ï	¸	I	3	?	F	"
6	Í	_	&	6	F	V	f	v	¶	û	³	M	G	C	µ	÷
7	!	0	*	7	G	W	g	w	ç	ù	¯	D	K	O	J	.
8	3	8	(	8	H	X	h	x	ê	¤	Î	@	9	P	M	E
9	"	9	)	9	I	Y	i	y	ë	Ô	1	<	6	-	1	@
A	4	6	*	:	J	Z	j	z	è	Ü	¬	5	=	+	S	·
B	%	7	+	;	K	[	k	{	ï	¢	½	7	;	$	*	%
C	&	2	´	<	L	\	l	|	î	£	¼	8	:	(	4	6
D	*	:	-	=	M	]	m	}	=	Ù	¾	E	4	%	ø	²
E	+	>	.	>	N	^	n	~	À	Û	*	A	>	'	,	#
F	'	?	/	?	O	_	o		§	ƒ	+	,	N	&	1	SP

5.6 IBM Code Page 865

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	i	<	SP	0	@	P	`	p	Ç	É	á	!	.	J	"	/
1	(	=	!	1	A	Q	a	q	ü	æ	í	"	2	L	$	±
2	)	;	"	2	B	R	b	r	é	Æ	ó	#	0	H	'	$
3	Ì	.	#	3	C	S	c	s	â	ô	ú	*	/	F	B	#
4	Ë	¶	$	4	D	T	d	t	ä	ö	ñ	1	)	B	E	!
5	Ê	§	%	5	E	U	e	u	à	ò	Ñ	I	3	?	F	"
6	Í	_	&	6	F	V	f	v	å	û	ª	M	G	C	µ	÷
7	!	0	*	7	G	W	g	w	ç	ù	º	D	K	O	J	.
8	3	8	(	8	H	X	h	x	ê	ÿ	¿	@	9	P	M	E
9	"	9	)	9	I	Y	i	y	ë	Ö	1	<	6	-	1	@
A	4	6	*	:	J	Z	j	z	è	Ü	¬	5	=	+	S	·
B	%	7	+	;	K	[	k	{	ï	ø	½	7	;	$	*	%
C	&	2	´	<	L	\	l	|	î	£	¼	8	:	(	4	6
D	*	:	-	=	M	]	m	}	ì	Ø	¡	E	4	%	ø	²
E	+	>	.	>	N	^	n	~	Ä	.	*	A	>	'	,	#
F	'	?	/	?	O	_	o		Å	ƒ	¤	,	N	&	1	SP

6 EPSON Extended Graphics Character Table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0	@	P	`	p	Ç	É	á	!	.	J	"	/
1			!	1	A	Q	a	q	ü	æ	í	"	2	L	$	±
2			"	2	B	R	b	r	é	Æ	ó	#	0	H	'	$
3			#	3	C	S	c	s	â	ô	ú	*	/	F	B	#
4			$	4	D	T	d	t	ä	ö	ñ	1	)	B	E	!
5		§	%	5	E	U	e	u	à	ò	Ñ	I	3	?	F	"
6			&	6	F	V	f	v	å	û	ª	M	G	C	µ	÷
7			*	7	G	W	g	w	ç	ù	º	D	K	O	J	.
8			(	8	H	X	h	x	ê	ÿ	¿	@	9	P	M	E
9			)	9	I	Y	i	y	ë	Ö	**1**	<	6	-	1	@
A			*	:	J	Z	j	z	è	Ü	¬	5	=	+	S	·
B			+	;	K	[	k	{	ï	¢	½	7	;	$	*	%
C			´	<	L	\	l	|	î	£	¼	8	:	(	4	6
D			-	=	M	]	m	}	ì	¥	¡	E	4	%	ø	²
E			.	>	N	^	n	~	Ä	.	*	A	>	'	,	#
F			/	?	O	_	o		Å	ƒ	+	,	N	&	1	SP

6.1 National Version EPSON Extended graphics Character Table

	Character Code (Hex)											
	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
1: USA	#	$	@	[	\	]	^	`	{			}	~
2: FRANCE	#	$	à	E	ç	§	^	`	é	ù	è	¨
3: GERMANY	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
4: U.K.	£	$	@	[	\	]	^	`	{			}	~
5: DENMARK	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
6: SWEDEN	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
7: ITALY	#	$	@	E	\	é	^	ù	à	ò	è	ì
8: SPAIN	.	$	@	¡	Ñ	¿	^	`	¨	ñ	}	~
9: JAPAN	#	$	@	[	¥	]	^	`	{			}	~
10: NORWAY	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
11: DENMARK 2	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
12: SPAIN 2	#	$	á	¡	Ñ	¿	é	`	í	ñ	ó	ú
13: LATIN AM.	#	$	á	¡	Ñ	¿	é	Ü	í	ñ	ó	ú
14: TURKEY	#	§	¦	Ç	Ö	Ô	Ü	™	ç	ö	Õ	ü
15: LEGAL	#	$	§	E	'	"	¶	`	©	®	†	™

6.2 EPSON Italic Character Table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0	@	P	`	p			*SP*	*0*	*@*	*P*	`	*p*
1			!	1	A	Q	a	q			*!*	*1*	*A*	*Q*	*a*	*q*
2			"	2	B	R	b	r			*"*	*2*	*B*	*R*	*b*	*r*
3			#	3	C	S	c	s			#	*3*	*C*	*S*	*c*	*s*
4			$	4	D	T	d	t			*$*	*4*	*D*	*T*	*d*	*t*
5			%	5	E	U	e	u			*%*	*5*	*E*	*U*	*e*	*u*
6			&	6	F	V	f	v			*&*	*6*	*F*	*V*	*f*	*v*
7			*	7	G	W	g	w			*	*7*	*G*	*W*	*g*	*w*
8			(	8	H	X	h	x			*(*	*8*	*H*	*X*	*h*	*x*
9			)	9	I	Y	i	y			*)*	*9*	*I*	*Y*	*i*	*y*
A			*	:	J	Z	j	z			*	*:*	*J*	*Z*	*j*	*z*
B			+	;	K	[	k	{			+	*;*	*K*	*[*	*k*	*{*
C			´	<	L	\	l	|			´	<	*L*	\	*l*	|
D			-	=	M	]	m	}			-	=	*M*	*]*	*m*	*}*
E			.	>	N	^	n	~			.	>	*N*	^	*n*	~
F			/	?	O	_	o				*/*	*?*	*O*	_	*o*	

This character table is selected by the command **ESC t**.

6.3 National Version EPSON Italic Character Table (part 1)

	Character Code (Hex)											
	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
1: USA	#	$	@	[	\	]	^	`	{			}	~
2: FRANCE	#	$	à	E	ç	§	^	`	é	ù	è	¨
3: GERMANY	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
4: U.K.	£	$	@	[	\	]	^	`	{			}	~
5: DENMARK	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
6: SWEDEN	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
7: ITALY	#	$	@	E	\	é	^	ù	à	ò	è	ì
8: SPAIN	.	$	@	¡	Ñ	¿	^	`	¨	ñ	}	~
9: JAPAN	#	$	@	[	¥	]	^	`	{			}	~
10: NORWAY	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
11: DENMARK 2	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
12: SPAIN 2	#	$	á	¡	Ñ	¿	é	`	í	ñ	ó	ú
13: LATIN AM.	#	$	á	¡	Ñ	¿	é	Ü	í	ñ	ó	ú
14: TURKEY	#	§	¦	Ç	Ö	Ô	Ü	™	ç	ö	Õ	ü
15: LEGAL	#	$	§	E	'	"	¶	`	©	®	†	™

6.3 National Version EPSON Italic Character Table (part 2)

<table>
<tr><th></th><th colspan="12">Character Code (Hex)</th></tr>
<tr><th></th><th>A3</th><th>A4</th><th>C0</th><th>DB</th><th>DC</th><th>DD</th><th>DE</th><th>E0</th><th>FB</th><th>FC</th><th>FD</th><th>FE</th></tr>
<tr><td>1: USA</td><td>#</td><td>$</td><td>@</td><td>[</td><td>\</td><td>]</td><td>^</td><td>`</td><td>{</td><td>|</td><td>}</td><td>~</td></tr>
<tr><td>2: FRANCE</td><td>#</td><td>$</td><td>à</td><td>E</td><td>ç</td><td>§</td><td>^</td><td>`</td><td>é</td><td>ù</td><td>è</td><td>¨</td></tr>
<tr><td>3: GERMANY</td><td>#</td><td>$</td><td>§</td><td>Ä</td><td>Ö</td><td>Ü</td><td>^</td><td>`</td><td>ä</td><td>ö</td><td>ü</td><td>ß</td></tr>
<tr><td>4: U.K.</td><td>£</td><td>$</td><td>@</td><td>[</td><td>\</td><td>]</td><td>^</td><td>`</td><td>{</td><td>|</td><td>}</td><td>~</td></tr>
<tr><td>5: DENMARK</td><td>#</td><td>$</td><td>@</td><td>Æ</td><td>Ø</td><td>Å</td><td>^</td><td>`</td><td>æ</td><td>ø</td><td>å</td><td>~</td></tr>
<tr><td>6: SWEDEN</td><td>#</td><td>¤</td><td>É</td><td>Ä</td><td>Ö</td><td>Å</td><td>Ü</td><td>é</td><td>ä</td><td>ö</td><td>å</td><td>ü</td></tr>
<tr><td>7: ITALY</td><td>#</td><td>$</td><td>@</td><td>E</td><td>\</td><td>é</td><td>^</td><td>ù</td><td>à</td><td>ò</td><td>è</td><td>ì</td></tr>
<tr><td>8: SPAIN</td><td>.</td><td>$</td><td>@</td><td>¡</td><td>Ñ</td><td>¿</td><td>^</td><td>`</td><td>¨</td><td>ñ</td><td>}</td><td>~</td></tr>
<tr><td>9: JAPAN</td><td>#</td><td>$</td><td>@</td><td>[</td><td>¥</td><td>]</td><td>^</td><td>`</td><td>{</td><td>|</td><td>}</td><td>~</td></tr>
<tr><td>10: NORWAY</td><td>#</td><td>¤</td><td>É</td><td>Æ</td><td>Ø</td><td>Å</td><td>Ü</td><td>é</td><td>æ</td><td>ø</td><td>å</td><td>ü</td></tr>
<tr><td>11: DENMARK 2</td><td>#</td><td>$</td><td>É</td><td>Æ</td><td>Ø</td><td>Å</td><td>Ü</td><td>é</td><td>æ</td><td>ø</td><td>å</td><td>ü</td></tr>
<tr><td>12: SPAIN 2</td><td>#</td><td>$</td><td>á</td><td>¡</td><td>Ñ</td><td>¿</td><td>é</td><td>`</td><td>í</td><td>ñ</td><td>ó</td><td>ú</td></tr>
<tr><td>13: LATIN AM.</td><td>#</td><td>$</td><td>á</td><td>¡</td><td>Ñ</td><td>¿</td><td>é</td><td>Ü</td><td>í</td><td>ñ</td><td>ó</td><td>ú</td></tr>
<tr><td>14: TURKEY</td><td>#</td><td>§</td><td>¦</td><td>Ç</td><td>Ö</td><td>Ô</td><td>Ü</td><td>™</td><td>ç</td><td>ö</td><td>Õ</td><td>ü</td></tr>
<tr><td>15: LEGAL</td><td>#</td><td>$</td><td>§</td><td>E</td><td>'</td><td>"</td><td>¶</td><td>`</td><td>©</td><td>®</td><td>†</td><td>™</td></tr>
</table>

7 Code Table OCR-A

	0	1	2	3	4	5	6	7
0	NUL	DLE	SP	0	@	P	⑀	p
1	SOH	DC1	!	1	A	Q	a	q
2	STX	DC2	"	2	B	R	b	r
3	ETX	DC3	#	3	C	S	c	s
4	EOT	DC4	$	4	D	T	d	t
5	ENQ	NAK	%	5	E	U	e	u
6	ACK	SYN	&	6	F	V	f	v
7	BEL	ETB	*	7	G	W	g	w
8	BS	CAN	(	8	H	X	h	x
9	HT	EM	)	9	I	Y	i	y
A	LF	SUB	*	:	J	Z	j	z
B	VT	ESC	+	;	K	[	k	{
C	FF	FS	¬	<	L	\	l	|
D	CR	GR	-	=	M	]	m	}
E	SO	RS	.	>	N	^	n	⑁
F	SI	US	/	?	O	⑂	o	$

8. Code Pages for the Eastern European Countries (EE)

8.1 CODEPAGE 437 Greek

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	SP	0	@	P	`	p	?	?	?	!	.	J	?	Ọ
1	!	1	A	Q	a	q	?	S	?	"	2	L	•	±
2	"	2	B	R	b	r	G	?	?	#	0	H	¦	$
3	#	3	C	S	c	s	?	?	µ	*	/	F	?	#
4	$	4	D	T	d	t	?	F	?	1	)	B	?	!
5	%	5	E	U	e	u	?	?	?	I	3	?	Æ	"
6	&	6	F	V	f	v	?	?	?	M	G	C	Ï	÷
7	*	7	G	W	g	w	T	O	p	D	K	O	Û	.
8	(	8	H	X	h	x	?	a	?	@	9	P	?	E
9	)	9	I	Y	i	y	?	ß	s	<	6	-	é	£
A	*	:	J	Z	j	z	?	?	?	5	=	+	?	¥
B	+	;	K	[	k	{	?	d	t	7	;	$	?	%
C	´	<	L	\	l	|	?	e	?	8	:	(	?	6
D	-	=	M	]	m	}	?	?	n	E	4	%	?	²
E	.	>	N	^	n	~	?	?	?	A	>	'	?	#
F	/	?	O	_	o		?	?	?	,	N	&	?	

SP = Space

8.2 CODEPAGE 851 Greek

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	SP	0	@	P	`	p	Ç	?	?	!	.	?	?	-
1	!	1	A	Q	a	q	ü		?	"	2	?	?	±
2	"	2	B	R	b	r	é	?	Ï	#	0	F	?	?
3	#	3	C	S	c	s	â	ô	Û	*	/	?	?	n
4	$	4	D	T	d	t	ä	ö	?	1	)	?	?	?
5	%	5	E	U	e	u	à	?	?	?	3	O	?	§
6	&	6	F	V	f	v	Á	û	G	?	?	a	µ	?
7	*	7	G	W	g	w	ç	ù	?	?	?	ß	?	¸
8	(	8	H	X	h	x	ê	Ǫ	?	?	9	?	?	°
9	)	9	I	Y	i	y	ë	Ö	?	<	6	-	?	¨
A	*	:	J	Z	j	z	è	Ü	?	5	=	+	p	?
B	+	;	K	[	k	{	ï	•	½	7	;	$	?	Ü
C	´	<	L	\	l	|	î	£	T	8	:	(	s	Ý
D	-	=	M	]	m	}	?	¦	?	?	4	?	?	?
E	.	>	N	^	n	~	Ä	?	*	?	>	g	t	#
F	/	?	O	_	o		?	\	+	,	G	&	r	

SP = Space

8.3 CODEPAGE 928 Greek

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	SP	0	@	P	`	p	Ç	É		°	?	?	Ú	p
1	!	1	A	Q	a	q	ü	æ	‹	±	?	?	a	?
2	"	2	B	R	b	r	é	Æ	’	^{2}	?		ß	?
3	#	3	C	S	c	s	â	ô	£	^{3}	G	S	?	s
4	$	4	D	T	d	t	ä	ö		t	?	?	d	t
5	%	5	E	U	e	u	à	ò		ˆ	?	?	e	?
6	&	6	F	V	f	v	å	û	₹	,?	?	F	?	n
7	*	7	G	W	g	w	ç	ù	§	**!**	?	?	?	?
8	(	8	H	X	h	x	ê	ÿ	¨	,?	T	?	?	?
9	)	9	I	Y	i	y	ë	Ö	©	,?	?	O	?	?
A	*	:	J	Z	j	z	è	Ü	?	,?	?	Ï	?	?
B	+	;	K	[	k	{	ï	¢	*****	**+**	?	Ÿ	?	?
C	´	<	L	\	l	|	î	£	¬	,?	?	•	µ	Ï
D	-	=	M	]	m	}	ì	¥		½	?	¦	?	Û
E	.	>	N	^	n	~	Ä	**.**		,?	?	?	?	é
F	/	?	O	_	o		Å	ƒ	!	,O	?	Æ	?	

SP = Space

8.4 CODEPAGE 855 Cyri

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	SP	0	@	P	`	p	?	?	?	!	.	?	?	–
1	!	1	A	Q	a	q	?	?	?	"	2	?	?	?
2	"	2	B	R	b	r	?	?	?	#	0	?	?	?
3	#	3	C	S	c	s	?	?	?	*	/	?	?	?
4	$	4	D	T	d	t	?	?	?	1	)	?	?	?
5	%	5	E	U	e	u	?	?	?	?	3	?	?	?
6	&	6	F	V	f	v	?	?	?	?	?	?	?	?
7	*	7	G	W	g	w	?	?	?	?	?	?	?	?
8	(	8	H	X	h	x	?	?	?	?	9	?	?	?
9	)	9	I	Y	i	y	?	?	?	<	6	-	?	?
A	*	:	J	Z	j	z	?	?	?	5	=	+	?	?
B	+	;	K	[	k	{	?	?	?	7	;	$	?	?
C	´	<	L	\	l	|	?	?	?	8	:	(	?	?
D	-	=	M	]	m	}	?	?	?	Å	4	?	?	
E	.	>	N	^	n	~	?	?	*	Ä	>	?	?	#
F	/	?	O	_	o		?	?	+	,	¤	&	m	

SP = Space

8.5 CODEPAGE 866

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	SP	0	@	P	`	p	?	?	?	!	.	J	?	?
1	!	1	A	Q	a	q	?	?	?	"	2	L	?	?
2	"	2	B	R	b	r	?	?	?	#	0	H	?	?
3	#	3	C	S	c	s	?	?	?	*	/	F	?	?
4	$	4	D	T	d	t	?	?	?	1	)	B	?	?
5	%	5	E	U	e	u	?	?	?	I	3	?	?	?
6	&	6	F	V	f	v	?	?	?	M	?	C	?	?
7	*	7	G	W	g	w	?	?	?	D	K	O	?	?
8	(	8	H	X	h	x	?	?	?	@	9	P	?	°
9	)	9	I	Y	i	y	?	?	?	<	6	-	?	**!**
A	*	:	J	Z	j	z	?	?	?	5	=	+	?	**!**
B	+	;	K	[	k	{	?	?	?	7	;	$	?	***/***
C	´	<	L	\	l	|	?	?	?	8	:	&	?	**m**
D	-	=	M	]	m	}	?	?	?	E	U	%	?	¤
E	.	>	N	^	n	~	?	?	?	A	>	'	?	**O**
F	/	?	O	_	o		?	?	?	,	N	(	?	

SP = Space

8.6 CODEPAGE 869

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	SP	0	@	P	`	p		?	?	!	.	?	?	!
1	!	1	A	Q	a	q		?	?	"	2	?	?	±
2	"	2	B	R	b	r		?	Ï	#	0	F	?	?
3	#	3	C	S	c	s			Û	*	/	?	?	n
4	$	4	D	T	d	t			?	1	)	?	?	?
5	%	5	E	U	e	u		?	?	?	3	O	?	§
6	&	6	F	V	f	v	?	Ÿ	G	?	?	a	µ	?
7	*	7	G	W	g	w		©	?	?	?	ß	?	ˆ
8	(	8	H	X	h	x	!	Ǫ	?	?	9	?	?	°
9	)	9	I	Y	i	y	¬	²	?	<	6	-	?	¨
A	*	:	J	Z	j	z	₱	³	?	5	=	+	p	?
B	+	;	K	[	k	{	#	•	½	7	;	$	?	ŭ
C	´	<	L	\	l	|	r	£	T	8	:	(	s	?
D	-	=	M	]	m	}	?	¦	?	?	U	Ç	?	é
E	.	>	N	^	n	~	%	?	*	?	>	e	t	O
F	/	?	O	_	o		?	?	+	,	S	&	t	

SP = Space

8.7 CODEPAGE 852

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	SP	0	@	P	`	p	Ç	É	á	!	.	ð	Ó	-
1	!	1	A	Q	a	q	ü	L	í	"	2	Đ	ß	?
2	"	2	B	R	b	r	é	L	ó	#	0	D	ô	3
3	#	3	C	S	c	s	â	ô	ú	*	/	Ë	N	?
4	$	4	D	T	d	t	ä	ö	A	1	)	d	n	?
5	%	5	E	U	e	u	u	L	a	Á	3	N	n	§
6	&	6	F	V	f	v	c	l	Ž	Â	A	í	Š	÷
7	*	7	G	W	g	w	ç	S	ž	E	a	î	š	,
8	(	8	H	X	h	x	l	s	E	S	9	e	R	°
9	)	9	I	Y	i	y	ë	Ö	e	<	6	-	Ú	¨
A	*	:	J	Z	j	z	O	Ü	¬	5	=	+	r	"
B	+	;	K	[	k	{	o	T	z	7	;	$	U	u
C	´	<	L	\	l	|	î	t	C	8	:	(	ý	R
D	-	=	M	]	m	}	Z	L	s	Z	U	T	Ý	r
E	.	>	N	^	n	~	Ä	×	*	z	>	U	t	#
F	/	?	O	_	o		C	c	+	,	¤	O	´	

SP = Space

8.8 KAMENICKY

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	SP	0	@	P	`	p	C	É	á	!	.	J	a	/
1	!	1	A	Q	a	q	ü	ž	í	"	2	L	ß	±
2	"	2	B	R	b	r	é	Ž	ó	#	0	H	G	$
3	#	3	C	S	c	s	(	ô	ú	*	/	F	J	#
4	$	4	D	T	d	t	ä	ö	n	1	)	B	3	!
5	%	5	E	U	e	u	D	ó	N	I	3	?	s	"
6	&	6	F	V	f	v	T	u	U	M	G	C	µ	÷
7	*	7	G	W	g	w	c	Ú	ô	D	K	O	t	.
8	(	8	H	X	h	x	e	ý	š	@	9	P	F	°
9	)	9	I	Y	i	y	E	Ö	r	<	6	-	T	•
A	*	:	J	Z	j	z	L	Ü	r	5	=	+	O	•
B	+	;	K	[	k	{	Í	Š	R	7	;	$!	d	/
C	´	<	L	\	l	|	l	L	¼	8	:	(	?	6
D	-	=	M	]	m	}	l	Ý	§	E	U	%	ø	²
E	.	>	N	^	n	~	Ä	R	*	A	>	'	e	€
F	/	?	O	_	o		Á	t̀	+	,	N	&	1	

SP = Space

8.9 ISO LATIN 2

	2	3	4	5	6	7		A	B	C	D	E	F
0	SP	0	@	P	`	p			°	R	Đ	r	ð
1	!	1	A	Q	a	q		A	a	Á	N	á	n
2	"	2	B	R	b	r		?	R	Â	N	â	n
3	#	3	C	S	c	s		L	l	A	Ó	a	ó
4	$	4	D	T	d	t		¤	'	Ä	Ô	ä	ô
5	%	5	E	U	e	u		L	l	L	O	l	o
6	&	6	F	V	f	v		S	s	C	Ö	c	ö
7	*	7	G	W	g	w		§	?	Ç	x	ç	÷
8	(	8	H	X	h	x		¨	S	C	R	c	r
9	)	9	I	Y	i	y		Š	š	É	U	é	u
A	*	:	J	Z	j	z		S	s	E	Ú	e	ú
B	+	;	K	[	k	{		T	t	Ë	U	ë	u
C	´	<	L	\	l	|		Z	z	E	Ü	e	ü
D	-	=	M	]	m	}		-	?	Í	Ý	í	ý
E	.	>	N	^	n	~		Ž	ž	Î	T	î	t
F	/	?	O	_	o			Z	z	D	ß	d	!

SP = Space

8.10 MAZOVIA

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	SP	0	@	P	`	p	Ç	E	Z	!	.	J	a	/
1	!	1	A	Q	a	q	ü	e	Z	"	2	L	ß	±
2	"	2	B	R	b	r	é	l	ó	#	0	H	G	$
3	#	3	C	S	c	s	â	ô	Ó	*	/	F	p	#
4	$	4	D	T	d	t	ä	ö	n	1	)	B	3	!
5	%	5	E	U	e	u	à	C	N	I	3	?	s	"
6	&	6	F	V	f	v	a	û	z	M	G	C	µ	÷
7	*	7	G	W	g	w	ç	ù	ƶ	D	K	O	t	.
8	(	8	H	X	h	x	ê	S	¿	@	9	P	F	°
9	)	9	I	Y	i	y	ë	Ö	**1**	<	6	-	T	**!**
A	*	:	J	Z	j	z	è	Ü	¬	5	=	+	O	**!**
B	+	;	K	[	k	{	ï	zł	½	7	;	$	d	**/**
C	´	<	L	\	l			î	L	¼	8	:	(	4	6
D	-	=	M	]	m	}	c	¥	i	E	U	%	ø	²
E	.	>	N	^	n	~	Ä	s	*	A	>	'	e	€
F	/	?	O	_	o		A	ƒ	+	,	N	&	1	

SP = Space

8.11 CODEPAGE 437 HUN

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	SP	0	@	P	`	p	Ç	É	á	!	.	J	a	/
1	!	1	A	Q	a	q	ü	æ	í	"	2	L	ß	±
2	"	2	B	R	b	r	é	Æ	ó	#	0	H	G	$
3	#	3	C	S	c	s	â	o	ú	*	/	F	p	#
4	$	4	D	T	d	t	ä	ö	ñ	1	)	B	3	**!**
5	%	5	E	U	e	u	à	ó	Ñ	I	3	?	s	"
6	&	6	F	V	f	v	å	u	ª	M	G	C	µ	÷
7	*	7	G	W	g	w	ç	Ú	O	D	K	O	t	.
8	(	8	H	X	h	x	ê	Ü	¿	@	9	P	F	°
9	)	9	I	Y	i	y	ë	Ö	**1**	<	6	-	T	**!**
A	*	:	J	Z	j	z	è	Ü	¬	5	=	+	O	**!**
B	+	;	K	[	k	{	ï	¢	½	7	;	$	d	**/**
C	´	<	L	\	l	|	î	£	¼	8	:	(	4	**6**
D	-	=	M	]	m	}	l	¥	i	E	U	%	ø	²
E	.	>	N	^	n	~	Ä	₧	*	A	>	'	e	€
F	/	?	O	_	o		Á	ƒ	+	,	N	&	1	

SP = Space

8.12 CODEPAGE 852 SEE

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	SP	0	Ž	P	ž	p	Ç	É	á	!	.	ð	Ó	-
1	!	1	A	Q	a	q	ü	L	í	"	2	Đ	ß	?
2	"	2	B	R	b	r	é	l	ó	#	0	D	Ô	3
3	#	3	C	S	c	s	â	ô	ú	*	/	Ë	N	?
4	$	4	D	T	d	t	ä	ö	A	1	)	d	n	?
5	%	5	E	U	e	u	u	L	a	Á	3	N	n	§
6	&	6	F	V	f	v	c	l	Ž	Â	A	Í	Š	÷
7	*	7	G	W	g	w	ç	S	ž	E	a	Î	š	,
8	(	8	H	X	h	x	l	s	E	S	9	e	R	°
9	)	9	I	Y	i	y	ë	Ö	e	<	6	-	Ú	¨
A	*	:	J	Z	j	z	O	Ü	¬	5	=	+	r	"
B	+	;	K	Š	k	š	o	T	z	7	;	$	U	u
C	´	<	L	Đ	l	ð	î	t	C	8	:	(	ý	R
D	-	=	M	C	m	c	Z	L	s	Z	U	T	Ý	r
E	.	>	N	C	n	c	Ä	×	*	z	>	U	t	#
F	/	?	O	_	o		C	c	+	,	¤	O	´	

SP = Space

8.13 CODEPAGE 866 LAT

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	i	<	SP	0	@	P	‹	p	?	P	?	!	.	Š	?	•
1	**(**	=	!	1	A	Q	a	q	?	C	?	"	2	L	?	‘
2	**)**	;	"	2	B	R	b	r	?	T	?	#	0	c	?	š
3	**Ì**	**.**	#	3	C	S	c	s	j	y	?	*	/	C	?	±
4	**Ë**	¶	$	4	D	T	d	t	?	k	?	1	)	B	?	°
5	**Ê**	§	%	5	E	U	e	u	E	X	?	}	3	?	?	·
6	**Í**	–	&	6	F	V	f	v	?	?	?	M	~	g	?	¶
7	•	**0**	*	7	G	W	g	w	?	r	?	Ã	K	¦	?	ž
8	**3**	8	(	8	H	X	h	x	?	?	?	@	9	§	?	Ž
9	•	9	)	9	I	Y	i	y	?	?	?	<	6	-	?	Æ
A	**4**	6	*	:	J	Z	j	z	?	?	?	5	=	+	?	**!**
B	**%**	7	+	;	K	[	k	{	?	?	?	7	;	$	?	**%**
C	**&**	**2**	,	<	L	\	2	|	M	b	?	8	:	(	?	N
D	*****	**:**	-	=	M	]	m	}	H	?	?	Ç	4	ã	?	š
E	**+**	**>**	.	>	N	^	n	~	O	?	?	A	>	â	?	**#**
F	**'**	?	/	?	O	_	o		?	?	?	,	N	&	?	

SP = Space

8.14 WIN LAT2

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	i	<	SP	0	@	P	`	p				°	R	Đ	r	ð
1	**(**	=	!	1	A	Q	a	q		`	-	±	Á	N	á	n
2	**)**	;	"	2	B	R	b	r	,	´	?	R	Â	N	â	n
3	**Ì**	**.**	#	3	C	S	c	s		**?**	L	l	A	Ó	a	ó
4	**Ë**	¶	$	4	D	T	d	t	„	”	¤	'	Ä	Ô	ä	ô
5	**Ê**	§	%	5	E	U	e	u	ÿ	C	A	µ	L	O	l	o
6	**Í**	_	&	6	F	V	f	v	†	-	₧	¶	C	Ö	c	ö
7	**!**	**0**	*	7	G	W	g	w	‡	—	§	?	Ç	x	ç	÷
8	**3**	8	(	8	H	X	h	x			¨	S	C	R	c	r
9	**"**	9	)	9	I	Y	i	y	‰	™	©	a	É	U	é	u
A	**4**	6	*	:	J	Z	j	z	Š	š	S	s	E	Ú	e	ú
B	**%**	7	+	;	K	[	k	{	<	>	«	»	Ë	U	ë	u
C	**&**	**2**	,	<	L	\	l	|	S	s	¬	L	E	Ü	e	ü
D	*****	:	-	=	M	]	m	}	T	ť	-	?	Í	Ý	í	ý
E	**+**	>	.	>	N	^	n	~	Ž	ž	®	l	Î	T	î	t
F	**'**	?	/	?	O	_	o		Z	z	Z	z	D	ß	ď	**!**

SP = Space

9. Code Pages for the Eastern European Countries (EE2)

9.1 CP 771

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	İ	<		0	@	P	`	p	?	P	?	!	.	J	?	E
1	(	=	!	1	A	Q	a	q	?	C	?	"	2	L	?	e
2	)	;	"	2	B	R	b	r	?	T	?	#	0	H	?	Ž
3	Ì	.	#	3	C	S	c	s	j	y	?	*	/	F	?	•
4	Ë	¶	$	4	D	T	d	t	?	k	?	1	)	B	?	¨
5	Ê	§	%	5	E	U	e	u	E	X	?	I	3	?	?	©
6	Í	–	&	6	F	V	f	v	?	?	?	M	G	C	?	Š
7	•	0	*	7	G	W	g	w	?	r	?	D	K	O	?	š
8	3	8	(	8	H	X	h	x	?	?	?	@	9	P	?	ä
9	•	9	)	9	I	Y	i	y	?	?	?	<	6	-	?	å
A	4	6	*	:	J	Z	j	z	?	?	?	5	=	+	?	â
B	%	7	+	;	K	[	k	{	?	?	?	7	;	$	?	ã
C	&	2	,	<	L	\	2	|	M	b	?	8	:	A	?	Ž
D	*	:	-	=	M	]	m	}	H	?	?	E	4	a	?	ž
E	+	>	.	>	N	^	n	~	O	?	?	A	>	C	?	O
F	'	?	/	?	O	_	o		?	?	?	,	N	c	?	

9.2 CP 773

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	i	<		0	@	P	`	p	ˆ	É	}	!	.	°	Ó	E
1	(	=	!	1	A	Q	a	q	ü	æ	¦	"	2	L	ß	e
2	)	;	"	2	B	R	b	r	é	Æ	Ó	#	0	?	Ö	Ž
3	Ì	.	#	3	C	S	c	s	~	Ç	Z	*	/	.	N	•
4	Ë	¶	$	4	D	T	d	t	ä	ö	z	1	)	¹	õ	¨
5	Ê	§	%	5	E	U	e	u	•	š	Z	±	3	„	Õ	©
6	Í	–	&	6	F	V	f	v	á	¢	?	M	÷	³	µ	Š
7	•	0	*	7	G	W	g	w	c	Ö	|	?	K		n	š
8	3	8	(	8	H	X	h	x	l	×	©	¼	9	²	°	ä
9	•	9	)	9	I	Y	i	y	‘	Ö	®	<	6	-	±	å
A	4	6	*	:	J	Z	j	z	Î	Ü	¬	5	=	+	¶	â
B	%	7	+	;	K	[	k	{	Ï	ø	½	7	;	$	·	ã
C	&	2	,	<	L	\	2	|	§	£	¼	8	:	A	Ã	Ž
D	*	:	-	=	M	]	m	}	Z	Ø	L	¶	4	a	•	ž
E	+	>	.	>	N	^	n	~	Ä	x	*	§	>	C	Â	O
F	'	?	/	?	O	_	o		Á	¤	+	,	N	c	*	

9.3 CP 774

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	i	<		0	@	P	`	p	Ç	É	á	!	.	a	a	/
1	(	=	!	1	A	Q	a	q	ü	æ	í	"	2	c	ß	±
2	)	;	"	2	B	R	b	r	é	Æ	ó	#	0	e	G	$
3	Ì	.	#	3	C	S	c	s	â	ô	ú	*	/	•	?	#
4	Ë	¶	$	4	D	T	d	t	ä	ö	û	1	)	©	G	„
5	Ê	§	%	5	E	U	e	u	à	ò	ú	À	3	š	s	“
6	Í	–	&	6	F	V	f	v	å	û	ª	ˆ	ä	å	µ	0
7	•	0	*	7	G	W	g	w	ç	ù	º	E	â	u	t	.
8	3	8	(	8	H	X	h	x	ê	ÿ	¿	Ž	9	ž	F	E
9	•	9	)	9	I	Y	i	y	ë	Ö	1	<	6	-	T	@
A	4	6	*	:	J	Z	j	z	è	Ü	¬	5	=	+	O	·
B	%	7	+	;	K	[	k	{	ï	¢	½	7	;	$	4	/
C	&	2	,	<	L	\	2	|	î	£	¼	8	:	&	4	6
D	*	:	-	=	M	]	m	}	ì	¥	¥	¨	4	%	ø	²
E	+	>	.	>	N	^	n	~	Ä	L	*	Š	>	'	e	O
F	'	?	/	?	O	_	o		Å	ƒ	+	,	Z	(	1	

9.4 CP 775

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	i	<		0	@	P	`	p	ˆ	É	}	!	.	a	Ó	
1	(	=	!	1	A	Q	a	q	ü	æ	¦	"	2	c	ß	±
2	)	;	"	2	B	R	b	r	é	Æ	ó	#	0	e	Æ	“
3	Ì	.	#	3	C	S	c	s	~	Ç	Z	*	/	•	N	¾
4	Ë	¶	$	4	D	T	d	t	ä	ö	z	1	)	©	õ	¶
5	Ê	§	%	5	E	U	e	u	Ÿ	š	z	À	3	š	Õ	§
6	Í	–	&	6	F	V	f	v	å	¢	"	C	ä	å	µ	÷
7	•	0	*	7	G	W	g	w	c	S	|	E	â	u	n	„
8	3	8	(	8	H	X	h	x	l	s	©	Ž	9	ž	°	E
9	•	9	)	9	I	Y	i	y	‘	Ö	®	<	6	-	±	@
A	4	6	*	:	J	Z	j	z	Î	Ü	¬	5	=	+	¶	.
B	%	7	+	;	K	[	k	{	Ï	ø	½	7	;	$	·	,
C	&	2	,	<	L	\	2	|	§	£	¼	8	:	&	Ã	³
D	*	:	-	=	M	]	m	}	z	Ø	L	¨	4	%	•	²
E	+	>	.	>	N	^	n	~	Ä	x	*	Š	>	'	Â	O
F	'	?	/	?	O	_	o		Å	¤	+	,	Z	(	´	

9.5 BATIC RIM

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	i	<		0	@	P	`	p				E	A	Š	a	š
1	**(**	=	!	1	A	Q	a	q		6	„	±	¨	N	©	n
2	**)**	;	"	2	B	R	b	r	,	3	¢	²	}	Â	~	Ã
3	**Ì**	**.**	#	3	C	S	c	s		?	£	³	C	Ó	c	ó
4	**Ë**	¶	$	4	D	T	d	t	„	„	¤	“	Ä	Æ	ä	Ç
5	**Ê**	§	%	5	E	U	e	u	…	•	„	?	Å	Õ	å	õ
6	**Í**	–	&	6	F	V	f	v	†	–	|	¶	E	Ö	e	ö
7	•	**0**	*	7	G	W	g	w	‡	—	§	•	•	x	‘	÷
8	**3**	8	(	8	H	X	h	x			Ø	ø	C	ä	c	å
9	•	9	)	9	I	Y	i	y	‰	™	©	¹	É	L	é	l
A	**4**	6	*	:	J	Z	j	z			Î	Ï	Z	S	z	s
B	**%**	7	+	;	K	[	k	{	<	>	*	+	Ž	â	•	ã
C	**&**	**2**	,	<	L	\	2	|			¬	¼	š	U	›	u
D	*	**:**	-	=	M	]	m	}				½	°	Z	±	z
E	**+**	>	.	>	N	^	n	~			®	¾	¦	Ž	§	ž
F	'	?	/	?	O	_	o				Æ	æ	¶	ß	·	

Appendix D IBM ProPrinter Quick Reference

This appendix contains basic information on the IBM ProPrinter XL 24 Emulation commands supported in the Printer:

Characters used in control functions appear in monospaced type. Table 1 explains some of the conventions used.

A pair of numbers separated by a slash (/) character indicates Column/Row notation. This notation refers to the location of a character in a standard code table, such as ASCII. (example: 1/B = 1B is the hex-code for Escape)

Spaces appear between characters in sequence for clarity; they are not part of the format.

At the end of this chapter you will find a listing of the IBM ProPrinter Emulation commands classified by Hex Code and a Hex - Decimal conversion table.

The following conventions are used in the command listings:

Table 1 Conventions

ESC	Escape (1/B), introduces an escape sequence
Pn	Numeric parameter, or number of units that specify a distance or quantity pertaining to the escape sequence, control function or control string. Accepted values are 0...9999, may be preceded by + or -. If the parameter is in normal notation like "200" the programming in hex-code is according to a ASCII table. ("200" = 32,30,30 in hex). If the parameter must be programmed in hex-code the notation is with a slash. (1/A = 1A in hex-code)
v1...vn	A series of parameters pertaining to the escape sequence, control function or control string.
SP	Is standing for Space (hex 20)

Table 2: Control Codes

Column/Row	Mnemonic	Function
0/0	NUL	Null
0/8	BS	Backspace
0/9	HT	Horizontal Tab
0/A	LF	Line Feed
0/B	VT	Vertical Tab
0/C	FF	Form Feed
0/D	CR	Carriage Return
0/E	SO	Double Width Printing By Line
0/F	SI	Condensed Printing (17.1 cpi)
1/1	DC1	Select Printer
1/2	DC2	Select Pica (10 cpi)
1/3	DC3	Buffer Data Flow Control
1/4	DC4	Cancel Double Width Printing By Line
1/8	CAN	Cancel Buffer
1/B	ESC	Initiate Escape Sequence
2/0	SP	Space
7/F	DEL	Delete
1/B 5/1 2/3	ESC Q #	Deselect Printer
1/B 5/1 2/4	ESC Q $	Deselect Printer

Table 3: Vertical Form Handling

Escape Sequence	Mnemonic	Function
ESC 0		Set Line Space to $^{1}/_{8}$"
ESC 1		Set Line Space to $^{7}/_{72}$"
ESC 2		Start Variable Line Space
ESC 4		Set Top of Form
ESC 5 P1		Carriage Return Function P1 = 1 or 0/1: select CR + LF P1 = 0 or 0/0: cancel CR
ESC A P1		Set Line Space to $^{P1}/_{72}$" ($^{P1}/_{60}$") P1 = $^{P1}/_{72}$" lpi (non AGM) P1 = $^{P1}/_{60}$" lpi (AGM) (P1 = 0/1...5/5) ***Note:*** Default = $^{12}/_{72}$" or 6 lpi
ESC B P1 P2 . . . P64 *NUL*		Set Vertical Tabs (Pn = 0/1...F/F)
ESC C P1		Set Form Length in Lines (P1 = 0/1...7/F)
ESC C *NUL* P1		Set Form Length in Inch (P1 = 0/1...1/6)
ESC N P1		Set Automatic Perforation Skip P1: is the number of lines from bottom of paper to skip. (P1 = 0/0...F/F)
ESC O		Cancel Automatic Perforation Skip
ESC [\ *EOT NUL NUL NUL* P1 *NUL*		Set Line Space Unit EOT = 0/4 P1 = B/4 : select 1/180" P1 = D/8 : select 1/216" P1 = 0/0 : setting remains unchanged

Table 3 (Cont.): Vertical Form Handling

Escape Sequence	Mnemonic	Function
ESC]		Reverse Line Feed
ESC [> P1 ; P2 ; P3 s *Native Command*	SPSIF	Select Paper Source and Insert Form (>), Print Gap, Paper Exit
ESC [P1 s *Native Command*	SPS	Paper Source: P1 = 0 : Manual Feed P1 = 1 : ASF, Bin 1 P1 = 2 : ASF, Bin 2 P1 = 3 : ASF, Bin 3 P1 = 6 : upper Tractor P1 = 7 : Tractor Feed (lower Tractor) P1 = 8 : AFS, Bins 1 or 2 P1 = 9 : ASF, Bins 2 or 3 P1 = 10: ASF, Bins 1 or 2 or 3 P1 = 15: upper and lower Tractor
ESC [; P2 s *Native Command*	AGC/PCC	Procedure: P2 = 0 : Automatic Gap Control P2 = 1 : Print Gap for 1-ply copy P2 = 2 : Print Gap for 2-ply copies P2 = 3 : Print Gap for 3-ply copies P2 = 4 : Print Gap for 4-ply copies P2 = 5 : Print Gap for 5-ply copies P2 = 6 : Print Gap for 6-ply copies P2 = 7 : Print Gap for 7-ply copies
ESC [; ; P3 s *Native Command*		Paper Exit: P3 = 0 : reserved P3 = 1 or 2 : Paper Exit Front Side (manual) P3 = 3 :Batch output (rear), default P3 = 0 or 1: ignored

Table 4: Horizontal Form Handling and Printing Modes

Escape Sequence	Function
ESC :	Select Elite (12 cpi)
ESC - P1	Cancel / Select Underline P1 = 0/0 cancel Underline Printing P1 = 0/1 set Underline Printing
ESC _ P1	Cancel / Select Overline Printing P1 = 0/0 cancel Overline Printing P1 = 0/1 set Overline Printing
ESC [@ *EOT NUL NUL NUL* P1 P2	Double, Multiple -Width/ - Height Mode P1 controls line spacing (e.g. 0/x) and character height (e.g. x/0) P2 controls character width P1 = 0/x line spacing unchanged P1 = 1/x single line space P1 = 2/x double line space P1 = 3/x triple line space P1 = 4/x quadruple line space P1 = x/0 charcter height unchanged P1 = x/1 single charcter height P1 = x/2 double character height P1 = x/3 triple character height P1 = x/4 quadruple character height P2 = 0/0 character width unchanged P2 = 0/1 single character width P2 = 0/2 double character width P2 = 0/3 triple character width P2 = 0/4 quadruple character width

Example: Coding to select "double line space", "double character height", and "double character width" in Hex:
1B 5B 40 04 00 00 00 22 02

Table 4 (Cont.): Horizontal Form Handling and Printing Modes

Escape Sequence	Function
ESC D P1 P2 ... P32 *NUL*	Set Horizontal Tabs (P1...P32 = 0/1...F/F)
ESC E	Select Emphasized Printing (bold)
ESC F	Cancel Emphasized Printing (bold)
ESC G	Select Double Strike Printing (bold)
ESC H	Cancel Double Strike Printing
ESC I P1	Select Character Mode P1 = 0/0 : Draft, 10 cpi P1 = 0/1 : Draft, Proportional P1 = 0/2 : Courier, 10 cpi P1 = 0/3 : Courier, Proportional P1 = 0/8 : Draft, 12 cpi P1 = 0/A : Courier, 12 cpi P1 = 1/0 : Draft, 17 cpi P1 = 1/2 : Courier, 17 cpi
ESC P P1	Cancel / Select Proportional Printing P1 = 0/0 or 0 : cancel Proportional P1 = 0/1 or 1 : select Proportional
ESC R	Restore Horizontal Tabs to Default
ESC S P1	Select Superscript/Subscript P1 = 0/0 or 0 : select Superscript P1 = 0/1 or 1 : select Subscript

Table 4 (Cont.): Horizontal Form Handling and Printing Modes

Escape Sequence	Mnemonic	Function
ESC T		Cancel Superscript/Subscript
ESC U P1		Cancel / Select Unidirectional Printing P1 = 0/0 or 0 : cancel Unidirectional P1 = 0/1 or 1 : select Unidirectional
ESC W P1		Cancel / Select Double Width P1 = 0/0 or 0 : cancel Double Width P1 = 0/1 or 1 : select Double Width
ESC X P1 P2		Set Left and Right Margins P1 : Left Margin P2 : Right Margin (Pn = 0/0...F/F)
ESC d P1 P2		Set Relative Horizontal Dot Position (P1 + P2 x 256)/120" (Pn = 0/0...F/F)
ESC <		Home Position of Printhead (left margin)
ESC ;		Set Left Margin at Current Position
ESC [P1 *SP* r *Native Command*	SPQ	Select Print Quality LQ / NLQ P1 = 0 : LQ P1 = 1 : NLQ; this is only valid if the NLQ type style is available. P1 = 2 : Draft P1 = 3 : HSD (High Speed Draft)
	Note:	The LQ / NLQ selection becomes active if a LQ-/NLQ-font is selected. Draft / HSD becomes active if type style DATA is selected.

Table 4 (Cont.): Horizontal Form Handling and Printing Modes

Escape Sequence	Mnemonic	Function	
ESC [P1 ; P2 x *Native Command*	CPL	Select Font and Character Pitch (parameter P1 or P2 may be skipped, see following alternative command sequences)	
ESC [P1 x *possible format of Native Command CPL*		P1 selects the font	
		P1 = 0 or missing	: Font is unchanged
		P1 = 1	: Data
		P1 = 2	: Roman
		P1 = 3	: Sans Serif
		P1 = 4	: Courier
		P1 = 5	: Prestige
		P1 = 6	: Script
		P1 = 7	: OCR-B
		P1 = 8	: OCR-A
		P1 = 9	: Orator-C
		P1 = 10	: Script
		P1 = 11	: Data Large
	Note:	Data Block is not available	
ESC [; P2 x *possible format of Native Command CPL*		P2 selects the character pitch	
		P2 = 0 or missing	: Pitch is unchanged
		P2 = 1	: 10 cpi
		P2 = 2	: 12 cpi
		P2 = 3	: 15 cpi
		P2 = 4	: (proportional)
		P2 = 5	: proportional
		P2 = 6	: 14.4 cpi
		P2 = 7	: 18 cpi
		P2 = 8	: 17.1 cpi
		P2 = 9	: 20 cpi

Table 5: Character Set Selection

Escape Sequence	Mnemonic	Function
ESC 6		Select Character Set 2
ESC 7		Select Character Set 1
ESC \ P1 P2		Print from All Character Set Number of codes = (P1 + P2 * 256) (Pn = 0/0...F/F)
ESC ^ P1		Print Single Character from All Character Set P1 = Number of Char. Set or Code Page (Pn = 0/0...F/F)
ESC [T n1 n2 NUL NUL P1 P2		Code Page Switching n1 = 4, n2 = 0 P1 P2 for Code-Page number, most significant byte first. P1 P2 1 181 : CP 437 U.S.A. 3 82 : CP 850 Multilingual 3 90 : CP 858 Multilingual + Euro 3 92 : CP 860 Portugal 3 95 : CP 863 Canada - French 3 97 : CP 865 Norway

Table 6: Graphics Modes

Escape Sequence	Mnemonic	Function
ESC 3 P1		Set Line Space to $^{P1}/_{216}$" ($^{P1}/_{180}$") $^{P1}/_{216}$ lpi (non AGM), $^{P1}/_{180}$ lpi (AGM) (P1 = 0/1...F/F)
ESC J P1		Perform $^{P1}/_{216}$" ($^{P1}/_{180}$") Line Feed $^{P1}/_{216}$ lpi (non AGM), $^{P1}/_{180}$ lpi (AGM) (P1 = 0/0...F/F)
ESC K P1 P2 v1 . . . vn		Standard Density Graphics Mode *) (P1 + P2 * 256) = number of data (Pn = 0/0...F/F)
ESC L P1 P2 v1 . . . vn		Double Density Graphics Mode *) (P1 + P2 * 256) = number of data (Pn = 0/0...F/F)
ESC Y P1 P2 v1 . . . vn		Double Speed & Density Graphics Mode *) (P1 + P2 * 256) = number of data (Pn = 0/0...F/F)
ESC Z P1 P2 v1 . . . vn		Quadruple Density Graphics Mode *) (P1 + P2 * 256) = number of data (Pn = 0/0...F/F)

*) *consecutive horizontal dots cannot be printed.*

Table 6 (Cont.): Graphics Modes

Escape Sequence	Mnemonic	Function
ESC [g P1 P2 P3 v1 . . . vn		Select Various Graphics Modes (IBM) P1 + P2 * 256 = number of data bytes + 1 (P1,P2 = 0/0...F/F) v1 .. vn = binary data in hex code

Parameter Table Graphic Density:

P3	Graphic type	dots per column	max. of columns	hor. density (dpi)	vert. density no AGM	vert. density AGM	
0/0	Standard Density (K)	8	816	60	72	60	
0/1	Double Density (L)	8	1632	120	72	60	
0/2	2xDensity / 2xSpeed (Y)	8	1632	120	72	60	*)
0/3	Quadruple Density (Z)	8	3264	240	72	60	*)
0/8	Standard Density	24	816	60	180	180	
0/9	Double Density	24	1632	120	180	180	
0/B	Triple Density	24	2448	180	180	180	
0/C	Hex Density	24	4896	360	180	180	*)

*) *consecutive horizontal dots cannot be printed.*

Example: box 8x8 dots with center point 2x2 dots, standard density,
8 dots / column
hex: 1B 5B 67 09 00 00 FF 81 81 99 99 81 81 FF

Table 7: Further Control Sequences, supported by
IBM Emulation Mode (Native Commands)

Escape Sequence	Mnemonic	Function
ESC [	$$	Control String Introducer (CSI) for 'ESC ['
ESC	$$/	Control String Introducer (CSI) for 'ESC'
ESC * P1 P2 P3 v1 . . . vn		Select Various Graphics Modes P2 + P3 * 256 = number of columns (P2,P3 = 0/0...F/F) v1 .. vn = binary data in hex code

Parameter Table Graphic Density:

P1	Graphic type	dots per column	max. of columns	hor. density (dpi)	vert. density no AGM	vert. density AGM	
0/0	Standard Density (K)	8	816	60	72	60	
0/1	Double Density (L)	8	1632	120	72	60	
0/2	2xDensity / 2xSpeed (Y)	8	1632	120	72	60	*)
0/3	Quadruple Density (Z)	8	3264	240	72	60	*)
0/4	CRT I	8	1088	80	72	60	
0/5	Plotter	8	979	72	72		
0/6	CRT II	8	1224	90	72	60	
0/B	Double Density Plotter	8	1958	144	72		*)
2/0	Standard Density	24	816	60	180	180	
2/1	Double Density	24	1632	120	180	180	
2/6	CRT III	24	1224	90	180	180	
2/7	Triple Density	24	2448	180	180	180	
2/8	Hex Density	24	4896	360	180	180	*)

*) *consecutive horizontal dots cannot be printed.*

Example: box 8x8 dots with center point 2x2 dots, standard density,
8 dots / column
hex: 1B 2A 00 08 00 FF 81 81 99 99 81 81 FF

Table 7 (Cont.): Further Control Sequences, supported by IBM Emulation Mode (Native Commands)

Escape Sequence	Mnemonic	Function
ESC [P1 ; P2 w	SNVCT	Set National Version and Code Table P1 = 1 - 15 national version depending on selected character set (see Appendix C Char. Set Tables) P2 = 3 digit code of the code table (see command SCT) P1 for national version **IBM SET 2**: P1 = 1 : U.S.A P1 = 2 : France P1 = 3 : Germany P1 = 4 : U.K. P1 = 5 : Denmark P1 = 6 : Sweden P1 = 7 : Italy P1 = 8 : Spain P1 = 9 : Japan P1 = 1 0 : Norway P1 = 1 1 : Denmark 2 P1 = 1 2 : Spain 2 P1 = 1 3 : Latin AM P1 = 1 4 : Turkey

P1 for **IBM CODE PAGE:**
P1 = 1 : CP 437
P1 = 2 : CP 850
P1 = 3 : CP 860
P1 = 4 : CP 863
P1 = 5 : CP 865
P1 = 6 : CP 858

P1 for **CODE PAGE EE2:**
P1 = 1 : CP 771
P1 = 2 : CP 773
P1 = 3 : CP 774
P1 = 4 : CP 775
P1 = 5 : CP BALTIC RIM

P1 for **CODE PAGE EE**:
P1 = 1 : CP 437 GK
P1 = 2 : CP 851 GK
P1 = 3 : CP 928 GK
P1 = 4 : CP 855 CYRI
P1 = 5 : CP 866
P1 = 6 : CP 869
P1 = 7 : CP 852
P1 = 8 : KAMENICKY
P1 = 9 : ISO LATIN 2
P1 = 1 0 : MAZOVIA
P1 = 1 1 : CP 437 HUN
P1 = 1 2 : CP 852 SEE
P1 = 1 3 : CP 866 LAT
P1 = 1 4 : WIN LAT2

Escape Sequence	Mnemonic	Function
ESC [; P2 w	SCT	Set Code Table P2 = 3 digit code of the code table P2 = 0 3 1 : ISO 8859/1; LATIN 1 P2 = 0 3 1 : ISO 8859/15; LATIN 9 P2 = 0 6 1 : IBM Set 1 P2 = 0 6 2 : IBM Set 2 P2 = 0 6 3 : IBM Code Page [1)] P2 = 0 7 1 : EPSON Ext. G. C. T P2 = 1 0 0 : CODE PAGES EE P2 = 1 0 1 : CODE PAGES EE2

1) depending on selected character set (P1) the IBM CODE PAGE 437, 850, 860, 863, 865, or 858 (P1 = 6; P2 = 63) will be activated!

Table 7 (Cont.): Further Control Sequences, supported by IBM Emulation Mode (Native Commands)

Escape Sequence	Mnemonic	Function
ESC [P1 ; P2 *SP* r	SM #	Select Macro and Change Emulation P1 = 1: Macro 1 P1 = 2: Macro 2 P1 = 3: Macro 3 P1 = 4: Macro 4 P2 = 0: no change of emulation P2 = 2: IBM ProPrinter Emulation P2 = 3: IBM ProPrinter AGM Emulation P2 = 4: EPSON Emulation
ESC M	RLF	Reverse Line Feed
ESC [< s	EJF	Eject Form
ESC [P1 ; P2 *SP* B	GSM	Graphic Size Modification P1 = 1 0 0 / P2 = 1 0 0 : normal height / width P1 = 2 0 0 / P2 = 2 0 0 : double height / width P1 = 3 0 0 / P2 = 3 0 0 : triple height / width P1 = 4 0 0 / P2 = 4 0 0 : quadruple height / width P1 and P2 max. = **8 0 0** in steps of 100 Graphic Size Modification for DATA LARGE P1 = 1 0 0 / P2 = 1 0 0 : normal height / width P1 and P2 max. **9 9 0 0** in steps of 100
ESC [P1 `	HPA	Set Horizontal Position Absolute P1 = print column (P1 = 0...9999)
ESC [P1 a	HPR	Set Horizontal Position Relative P1 = print column (P1 = 0...9999)
ESC [P1 b	RPT	Repeat Character P1 = number of repetitions (P1 = 1...999)

Table 7 (Cont.): Further Control Sequences, supported by IBM Emulation Mode (Native Commands)

Escape Sequence	Mnemonic	Function
ESC [P1 d	VPA	Set Vertical Position Absolute P1 = 0 or 1: Top of Form / Top Margin P1 = 2... 9999: Vertical Line
ESC [P1 e	VPR	Set Vertical Position Relative P1 = 0 or 1: moves the position one line P1 = 2... 9999: Vertical Line
ESC [P1 g	TBC	Tabulation Clear P1 = 0: at active print pos. all tabs and margin marker, P1 = 3: all horizontal-, P1 = 4: all vertical tabs and margin marker
ESC [P1 w	SNV	Set National Version P1 = 1 - 15 national version depending on selected character set (see SNVCT and Appendix C Character Set Tables)
ESC [P1 {	LSL	Line Space Load P1 = 1, 2, 3, 4, 6, 8, 12, 16, 24, 48, 60, 72, 90, 144, 180, 360

Table 7 (Cont.): Further Control Sequences, supported by IBM Emulation Mode (Native Commands)

Escape Sequence	Mnemonic	Function
ESC [P1 m	SGR	Set Graphic Rendition P1 = 0: default - no rendition or rendition reset P1 = 1: bold P1 = 3: italics P1 = 4: underline P1 = 9: crossed out or strike through printing P1 = 20: enlarged double width printing P1 = 21: double underline P1 = 22: bold reset P1 = 23: italics reset P1 = 24: underline reset P1 = 29: crossed out reset P1 = 30 to 36: ignored P1 = 53: over lined P1 = 55: over lined reset

Table 7 (Cont.): Further Control Sequences, supported by IBM Emulation Mode (Native Commands)

Escape Sequence	Mnemonic	Function
ESC [; P2 ; P3 ; P4 ; P5 ; P6 ; P7 *SP* z		
see Appendix F	BH	Barcode Header
BARCODE Programming		P2: Barcode typ
		P3: Height of barcode
		P4: Width of the thin bars
		P5: Width of the thin gaps
		P6: Ratio width to thin (bars / gaps)
		P7: Uni-directional or bi-directional printing
		0 : or not programmed: means no changes
		1 : uni-directional printing in LQ
		2 : bi-directional printing in LQ
		3 : uni-directional printing in NLQ
		4 : bi-directional printing in NLQ
ESC [? 0 h	SMBC	Set Mode Barcode
ESC [? 0 ***l***	RSBC	Reset Mode Barcode

Hex Code	Format	Page
00	Null	D-2
08	Backspace	D-2
09	Horizontal Tab	D-2
0A	Line Feed	D-2
0B	Vertical Tab	D-2
0C	Form Feed	D-2
0D	Carriage Return	D-2
0E	Select Double Width (one line)	D-2
0F	Select Condensed Mode (17,1 cpi)	D-2
11	Select Printer	D-2
12	Select Pica (10 cpi)	D-2
13	Buffer Data Flow Control	D-2
14	Cancel Double Width	D-2
18	Cancel Buffer	D-2
1B	Escape	D-2
20	Space	D-2
7F	Delete	D-2
1B 30	Set Line Space to $^1/_8$"	D-3
1B 31	Set Line Space to $^7/_{72}$"	D-3
1B 32	Start Variable Line Space	D-3
1B 34	Set Top Of Form	D-3
1B 36	Select Character Set 2	D-9
1B 37	Select CHaracter Set 1	D-9
1B 3A	Select Elite (12 cpi)	D-5
1B 3B	Set Left Margin at Current	D-7
1B 3C	Home Position of Printhead	D-7
1B 45	Select Emphasized Printing (bold)	D-6
1B 46	Cancel Emphasized Printing	D-6
1B 47	Select Double Strike (bold)	D-6
1B 48	Cancel Double Strike	D-6
1B 4D	Reverse Line Feed	D-14
1B 4F	Cancel Automatic Perforation Skip	D-3
1B 52	Restore Horizontal Tabs to Default	D-6

Hex Code	Format	Page
1B 54	Cancel Superscript/Subscript	D-7
1B 5D	Reverse Line Feed	D-4
24 24	Control String Introducer for ESC [	D-12
24 24 2F	Control String Introducer for ESC	D-12
1B 2D 00 / 1B 2D 01	Cancel / Select / Underline	D-5
1B 33 P_1	Set Line Space to $^{P1}/_{216}$" ($^{P1}/_{180}$")	D-10
1B 35 01 / 1B 35 00	Carriage Return Function	D-3
1B 41 P_1	Set Line Space to $^{P1}/_{72}$" ($^{P1}/_{60}$")	D-3
1B 43 P_1	Set Form Length in Lines	D-3
1B 49 P_1	Select Character Mode	D-6
1B 4A P_1	Perform $^{P1}/_{216}$" ($^{P1}/_{180}$") Line feed	D-10
1B 4E P_1	Set Automatic Perforation Skip	D-3
1B 50 00 / 1B 50 01	Cancel / Select Proportional Printing	D-6
1B 51 23 or 1B 51 24	Deselect Printer	D-2
1B 53 00 / 1B 53 01	Select Superscript / Subscipt	D-6
1B 55 00 / 1B 55 01	Cancel / Select Unidirectional Printing	D-7
1B 57 00 / 1B 57 01	Cancel / Select Double Width	D-7
1B 5E P_1	Single Character from All Char. Set	D-9
1B 5F 00 / 1B 5F 01	Cancel / Select Overline Printing	D-5
1B 2A P_1 P_2 P_3 data	Select Various Graphics Modes	D-12
1B 42 P_1....P_{64} 00	Set Vertical Tabs	D-3
1B 43 00 P_1	Set Form Lenght in Inches	D-3
1B 44 P_1...P_n 00	Set Horizontal Tabs	D-6
1B 4B P_1 P_2 data	Standard Density Graphics Mode	D-10
1B 4C P_1 P_2 data	Double Density Graphics Mode	D-10
1B 58 P_1 P_2	Set Left and Right Margins	D-7
1B 59 P_1 P_2 data	Double Speed & Double Density Graphics Mode	D-10
1B 5A P_1 P_2 data	Quadruple density Graphics Mode	D-10
1B 5B 3B P_2 73	AGC / PCC Procedure	D-4
1B 5B 3B P_2 77	Set Code Table	D-13
1B 5B 3B P_2 3B P_3 3B P_4 3B P_5 3B P_6 3B P_7 20 7A	Barcode Header	D-17

Hex Code	Format	Page
1B 5B 3C 73	Eject Form	D-14
1B 5B 3E 73	Insert Form	D-4
1B 5B 3E P_1 3B P_2 3B P_3 73	Select Paper Source and Insert Form	D-4
1B 5B 3F 30 68	Set Mode Barcode	D-17
1B 5B 3F 30 6C	Reset Mode Barcode	D-17
1B 5B 40 04 00 00 00 P_1 P_2	Double, Multible -Width/-Height Mode	D-5
1B 5B 54 n_1 n_2 NUL NUL P_1 P_2	Code Page Switching	D-9
1B 5B 5C 04 00 00 00 P_1 00	Set Line Space Unit	D-3
1B 5B 67 P_1 P_2 P_3 data	Select Various Graphics Modes (IBM)	D-11
1B 5B P_1 20 58	Select Print Quality LQ / NLQ	D-7
1B 5B P_1 3B P_2 20 72	Select Macro and Change Emulation	D-14
1B 5B P_1 3B P_2 20 42	Graphic Size Modification	D-14
1B 5B P_1 3B P_2 77	Set National Version and Code Table	D-13
1B 5B P_1 3B P_2 78	Select Font and Character Pitch	D-8
1B 5B P_1 60	Set Horizontal Position Absolute	D-14
1B 5B P_1 61	Set Horizontal Position Relative	D-14
1B 5B P_1 62	Repeat Character	D-14
1B 5B P_1 64	Set Vertical Position Absolute	D-15
1B 5B P_1 65	Set Vertical Position Relative	D-15
1B 5B P_1 67	Tabulation Clear	D-15
1B 5B P_1 6D	Set Graphic Rendition	D-16
1B 5B P_1 73	Select Paper Source	D-4
1B 5B P_1 77	Set National Version	D-15
1B 5B P_1 7B	Line Space Load	D-15
1B 5C P_1 P_2	Print from All Character Set	D-9
1B 64 P_1 P_2	Set Relative Horizontal Dot Position	D-7

Hex - Decimal Conversion Table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	9	25	41	57	73	89	105	121	137	153	269	185	201	217	233	249
A	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
B	11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
C	12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
D	13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
E	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
F	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

Appendix E EPSON LQ 2550 and ESC/P2 Quick Reference

This appendix contains basic information on the EPSON LQ 2550 and ESC/P2 Printer Emulation:

Characters used in control functions appear in monospaced type. Table 1 explains some of the conventions used.

A pair of numbers separated by a slash (/) character indicates Column/Row notation. This notation refers to the location of a character in a standard code table, such as ASCII. (example: 1/B = 1B is the hex-code for Escape)

Spaces appear between characters in sequence for clarity; they are not part of the format.

At the end of this chapter you will find a listing of the EPSON LQ 2550 and ESC/P2 Emulation commands classified by Hex Code and a Hex - Decimal conversion table.

The following conventions are used in the command listings:

Table 1 Conventions

ESC	Escape (1/B), introduces an escape sequence
P1	Numeric parameter, or number of units that specify a distance or quantity pertaining to the escape sequence, control function or control string. Accepted values are 0...9999, may be preceded by + or -. If the parameter is in normal notation like "200" the programming in hex-code is according to a ASCII table. ("200" = 32,30,30 in hex). If the parameter must be programmed in hex-code the notation is with a slash. (1/A = 1A in hex-code)
v1...vn	A series of parameters pertaining to the escape sequence, control function or control string.
SP	Is standing for Space (hex 20)

Table 2: Control Codes

Column/Row	Mnemonic	Function
0/0	NUL	Null
0/8	BS	Backspace
0/9	HT	Horizontal Tab
0/A	LF	Line Feed
0/B	VT	Vertical Tab
0/C	FF	Form Feed
0/D	CR	Carriage Return
0/E	SO	Double Width Printing By Line
0/F	SI	Condensed Printing
1/1	DC1	Select Printer
1/2	DC2	Select Pica (10 cpi)
1/3	DC3	Deselct Printer
1/4	DC4	Cancel Double Width Printing By Line
1/8	CAN	Cancel Buffer
1/B	ESC	Initiate Escape Sequence
2/0	SP	Space
7/F	DEL	Delete

Table 3: Terminal Management

Escape Sequence	Mnemonic	Function
ESC @		Initialize Printer
ESC =		Set Most Significant Bit to 0
ESC >		Set Most Significant Bit to 1
ESC #		Cancel Most Significant Bit Control

Vertical Form Handling

The printer is always equipped with two continuous form tractors. The last sheet of a continuous form stack can be printed on up to the end of the form.

The capabillity of the printer to feed paper from different sources is optimally supplemented by the option that automatically adjust the distance between the print head and the print bar.

Table 4: Vertical Form Handling

Escape Sequence	Mnemonic	Function
ESC 0		Set Line Space to $^{1}/_{8}$"
ESC 2		Set Line Space to $^{1}/_{6}$"
ESC 3 P1		Set Line Space to $^{P1}/_{180}$" (P1 =0/ 0...F/F)
ESC + P1		Set Line Space to $^{P1}/_{360}$" (P1 = 0/0...F/F)
ESC A P1		Set Line Space to $^{P1}/_{60}$" (P1 = 0/0...7/F)
ESC B *NUL*		Clear Vertical Tabs
ESC B P1 P2 . . . P16 *NUL*		Set Vertical Tabs (P1...P16 = 0/1...F/F)
ESC C P1		Set Form Length in Lines (P1 = 0/1...7/F)
ESC C *NUL* P1		Set Form Length in Inches (P1 = 0/1...1/6)
ESC J P1		Perform $^{P1}/_{180}$" Line Feed (P1 = 0/0...F/F)
ESC N P1		Set Automatic Perforation Skip P1 is the number of lines from bottom of paper to skip. (P1 = 0/1...7/F)
ESC O		Cancel Automatic Perforation Skip
ESC b P1 P2 .. P16 *NUL*		Set Vertical Tabs in Channel P1 P1 = 0/0 .. 0/7 : channel 0 - 7 P2..P16 = line number (P2..P16 = 0/1..F/F)

Table 4: (Cont.) Vertical Form Handling

Escape Sequence	Mnemonic	Function
ESC b P1 *NUL*		Clear all Tabs in Channel P1 P1 = 0/0 .. 0/7 : channel 0 - 7
ESC j P1		Perform $^{P1}/_{180}$" Reverse Line Feed (P1 = 0/0...F/F)
ESC / P1		Select Vertical Tab Channel P1 = 0/0 .. 0/7 : channel 0 .. 7
ESC *EM* P1		Form Feed and ASF Control Form Feed: *EM* = 1/9 ASF Control: P1 = 3/1: ASF Bin 1 or Bin 2 P1 = 3/2: ASF Bin 2 or Bin 3 P1 = 3/3: ASF Bin1 or Bin 2 or Bin 3 P1 = R: (5/2) eject sheet
ESC [> P1 ; P2 ; P3 s *Native Command*	SPSIF	Select Paper Source and Insert Form, Print Gap, Paper Exit (any parameter > or P1 to P4 may be skipped, see following alternative command sequences); > = Insert Form
ESC [P1 s *Native Command*	SPS	Paper Source: P1 = 3/0 : Manual Feed P1 = 3/1 : ASF, select Bin 1 P1 = 3/2 : ASF, select Bin 2 P1 = 3/3 : ASF, select Bin 3 P1 = 3/6 : select upper Tractor P1 = 3/7 : select lower Tractor P1 = 3/8 : ASF, Bin 1 or Bin 2 P1 = 3/9 : ASF, Bin 2 or Bin 3 P1 = 3/1 3/0 : ASF, Bin1 or Bin 2 or Bin 3 P1 = 3/1 3/5 : upper and lower Tractor

Table 4: (Cont.) Vertical Form Handling

Escape Sequence	Mnemonic	Function
ESC [; P2 s *Native Command,*	AGC/PCC	Print Gap Control: P2 = 3/0 : Automatic Gap Control P2 = 3/1 : Print Gap for 1-ply copy P2 = 3/2 : Print Gap for 2-ply copies P2 = 3/3 : Print Gap for 3-ply copies P2 = 3/4 : Print Gap for 4-ply copies P2 = 3/5 : Print Gap for 5-ply copies P2 = 3/6 : Print Gap for 6-ply copies P2 = 3/7 : Print Gap for 7-ply copies
ESC [; ; P3 s *Native Command*		Paper Exit: P3 = 0 : reserved P3 = 1 or 2 : Paper Exit Front Side (manual) P3 = 3 : Batch output (rear), default P3 = 0 or 1 : ignored

Table 5: Horizontal Form Handling and Printing Modes

Escape Sequence	Function
ESC *SO*	Select Double Width for One Line
ESC *SI*	Select Condensed 10 cpi -> 17 cpi 12 cpi -> 20 cpi 15 cpi -> 15 cpi (unchanged) proportional -> proportional cond.
ESC *SP* P1	Select Intercharacter Space Unit 1/120" for DRAFT (P1 = 0/0...7/F) Unit 1/180" for NLQ/LQ (P1 = 0/0...7/F)
ESC ! P1	Select Multiple Print Mode P1 selects: Bit 0 = 0 : 10 cpi (Pica) Bit 0 = 1 : 12 cpi (Elite) Bit 1 = 1 : proportional Bit 2 = 1 : Condensed Bit 3 = 1 : Emphasized Bit 4 = 1 : Double Strike Bit 5 = 1 : Double Width Bit 6 = 1 : Italics Bit 7 = 1 : Underline
ESC $ P1 P2	Set Absolute Horizontal Position (P1 + P2 * 256) * $^1/_{60}$" (P1 = 0/0...F/F) (P2 = 0/0...0/3)
ESC \ P1 P2	Set Relative Horizontal Position Draft: (P1 + P2 * 256) * $^1/_{120}$" (P1 = 0/0...F/F) (P2 = 0/0...0/6) NLQ/LQ: (P1 + P2 * 256) * $^1/_{180}$" (P1 = 0/0...F/F) (P2 = 0/0...0/3)
ESC % P1	Select Standard / User Defined Character Set P1 = 0/0 : Standard Character Set P1 = 0/1 : User Defined Character Set

Table 5 (Cont.): Horizontal Form Handling and Printing Modes

Escape Sequence	Function
ESC & *NUL* P1 P2 P3 P4 P5 v1 .. vn	Define User Defined Characters P1 = first code table position (P1 = 0/0...P2) P2 = last code table position (P2 = P1...7/F) P3 = front space (P3 = 0/0...5/0) P4 = body length Draft: (P4 = 0/0...0/F) LQ: (P4 = 0/0...2/5) P5 = rear space (P5 = 0/0...5/0) v1 .. vn = binary data in hex (vn = 0/0...F/F)

Notes:

- This Command defines one or more characters in a RAM character table.
- All User Defined Characters are erased when the printer is switched off.
- Set the Interface Buffer to 1k or 8K (max 50 defined char in LQ, 128 in draft), or use a RAM card for up to 128 User Defined Characters in LQ.
- Set maximum every second dot to "1" in a horizontal line !
- User Defined Characters can be defined in four different print modes:

resolution (vertical x horizontal)	
Normal Size with Draft:	24 x 15
Normal Size with LQ / proport.:	24 x 37
Sub-/ Superscript with Draft:	16 x 15
Sub-/ Superscript with LQ / proport.:	16 x 37

- The characters can only be activated in the same mode as defined.
- The character layout is coded in three bytes (24 bit vertical) or two bytes (16 bit vertical) per column, top to bottom.
- To print the character change to the User Defined Character Set with ESC % .

Examlpe: vertical box, normal size with draft at code table position "41" (P3=8, P4=5, P5=8)

hex: 1B 26 00 41 41 08 05 08 FF FF FF 00 00 00 80 00 01 00 00 00 FF FF FF

Table 5: (Cont.) Horizontal Form Handling and Printing Modes

Escape Sequence	Function
ESC (- P1 P2 P3 P4 P5	Select Line Marking P1 = 0/3 (fixed value) P2 = 0/0 (fixed value) P3 = 0/1 (fixed value) P4 = 0/1 : underline P4 = 0/2 : strike through P4 = 0/3 : overscore P5 = 0/0 : cancel score line selected by P4 P5 = 0/1 : single continuous line P5 = 0/2 : double continuous line P5 = 0/5 : single broken line P5 = 0/6 : double broken line
ESC 4	Set Italics
ESC 5	Cancel Italics
ESC <	Select Unidirectional Mode (one line)
ESC : *NUL* P1 *NUL*	Copy ROM Character Set to RAM P1 = 0/0 : ROMAN P1 = 0/1 : SANS SERIF P1 = 0/2 : COURIER P1 = 0/3 : PRESTIGE P1 = 0/4 : SCRIPT P1 = 0/5 : OCR-B P1 = 0/6 : OCR-A P1 = 0/7 : ORATOR-C P1 = 0/8 : ORATOR
ESC - P1	Underline Printing P1 = 0/1 : set Underline Printing P1 = 0/0 : cancel Underline Printing
ESC D *NUL*	Clear Horizontal Tabs

Table 5: (Cont.) Horizontal Form Handling and Printing Modes

Escape Sequence	Function
ESC D P1 P2 . . . P32 *NUL*	Set Horizontal Tabs P1 ... P32 = tab position (Pn = 0/1..F/F)
ESC E	Select Emphasized Printing (bold)
ESC F	Cancel Emphasized Printing
ESC G	Select Double Strike Printing (bold)
ESC H	Cancel Double Strike Printing
ESC M	Select Elite (12 cpi)
ESC P	Select Pica (10 cpi)
ESC Q P1	Set Right Margin (P1 = 0/4 ... F/F)
ESC S P1	Select Superscript/Subscript P1 = 0/0 or 3/0 : select Superscript P1 = 0/1 or 3/1 : select Subscript
ESC T	Cancel Superscript/Subscript
ESC U P1	Cancel/Select Unidirectional Printing P1 = 0/0 or 3/0 : cancel Unidirectional P1 = 0/1 or 3/1 : select Unidirectional
ESC W P1	Cancel/Select Double Width P1 = 0/0 or 3/0 : cancel Double Width P1 = 0/1 or 3/1 : select Double Width
ESC a P1	Select Justification P1 = 0/0 : select left justification P1 = 0/1 : center between margins P1 = 0/2 : select right justification P1 = 0/3 : select full justification

Table 5: (Cont.) Horizontal Form Handling and Printing Modes

Escape Sequence	Function
ESC g	Select Pitch 15 cpi
ESC k P1	Select Font P1 = 0/0 : ROMAN P1 = 0/1 : SANS SERIF P1 = 0/2 : COURIER P1 = 0/3 : PRESTIGE P1 = 0/4 : SCRIPT P1 = 0/5 : OCR-B P1 = 0/6 : OCR-A P1 = 0/7 : ORATOR-C P1 = 0/8 : ORATOR P1 = 1/1 : DATA LARGE
ESC ***l*** P1	Set Left Margin (P1 = 0/0...F/C)
ESC p P1	Cancel/Select Proportional P1 = 0/0 or 3/0 : cancel proportional P1 = 0/1 or 3/1 : select proportional
ESC q P1	Select Character Style P1 = 0/0 : normal style P1 = 0/1 : outline P1 = 0/2 : shadow P1 = 0/3 : outline + shadow

Table 5: (Cont.) Horizontal Form Handling and Printing Modes

Escape Sequence	Mnemonic	Function
ESC w P1		Cancel/Select Double Height P1 = 0/0 or 3/0 : cancel P1 = 0/1 or 3/1 : select
ESC x P1		Select Character Quality P1 = 0/0 or 3/0 : select Draft P1 = 0/1 or 3/1 : select LQ or NLQ dep. on set-up
ESC [P1 ; P2 *SP* B *Native Command,*	GSM	Graphic Size Modification P1 = 1 0 0 / P2 = 1 0 0 : normal height / width P1 = 2 0 0 / P2 = 2 0 0 : double height / width P1 = 3 0 0 / P2 = 3 0 0 : triple height / width P1 = 4 0 0 / P2 = 4 0 0 : quadruple height / width P1 and P2 max. = **8 0 0** in steps of 100 Graphic Size Modification for DATA LARGE P1 = 1 0 0 / P2 = 1 0 0 : normal height / width P1 and P2 max. **9 9 0 0** in steps of 100

Table 5: (Cont.) Horizontal Form Handling and Printing Modes

Escape Sequence	Mnemonic	Function
ESC [P1 ; P2 x *Native Command,*	CPL	Select Font and Character Pitch (any parameter P1 or P2 may be skipped, see following alternative command sequences)
ESC [P1 x *possible format of Native Command CPL*		P1 selects the font: P1 = 0 or missing : Font is unchanged P1 = 1 : DATA P1 = 2 : ROMAN P1 = 3 : SANS SERIF P1 = 4 : COURIER P1 = 5 : PRESTIGE P1 = 6 : SCRIPT P1 = 7 : OCR-B P1 = 8 : OCR-A P1 = 9 : ORATOR-C P1 = 10 : ORATOR P1 = 11 : DATA LARGE
	Note:	Data Block is not available
ESC [; P2 x *possible format of Native Command CPL*		P2 selects the character pitch: P2 = 0 or missing : Pitch is unchanged P2 = 1 : 10 cpi P2 = 2 : 12 cpi P2 = 3 : 15 cpi P2 = 4 : proportional P2 = 5 : proportional P2 = 6 : 14.4 cpi P2 = 7 : 18 cpi P2 = 8 : 17.1 cpi P2 = 9 : 20 cpi

Table 6: Graphics Modes

Escape Sequence	Function
ESC ? K P1	Reassign Graphics Mode K [1)] Standard Density, 8 dpc
ESC ? L P1	Reassign Graphics Mode L [1)] Double Density, 8 dot per column
ESC ? Y P1	Reassign Graphics Mode Y [1)] Double Density & -Speed, 8 dot per col.
ESC ? Z P1	Reassign Graphics Mode Z [1)] Quadruple Density, 8 dot per column
ESC K P2 P3 v1 . . . vn	Standard Density Graphics Mode [1)]
ESC L P2 P3 v1 . . . vn	Double Density Graphics Mode [1)]
ESC Y P2 P3 v1 . . . vn	Double Density / Double Speed Graphics Mode [1)]
ESC Z P2 P3 v1 . . . vn	Quadruple Density Graphics Mode [1)]

[1)] : for coding of P1, P2, P3 see **ESC *** on the next page

Table 6: (Cont.) Graphics Modes

Escape Sequence	Function
ESC * P1 P2 P3 v1 . . . vn	Select Various Graphics Modes P2 + P3 * 256 = number of columns (0/0...F/F) v1 .. vn = binary data in hex code (0/0...F/F)

Parameter Table Graphic Density:

P1	Graphic type	dots / column	max. number of columns	hor. density (dpi)	
0/0	Standard Density (K)	8	816	60	
0/1	Double Density (L)	8	1632	120	
0/2	2xDensity / 2xSpeed (Y)	8	1632	120	*)
0/3	Quadruple Density (Z)	8	3264	240	*)
0/4	CRT I	8	1088	80	
0/6	CRT II	8	1224	90	
2/0	Standard Density	24	816	60	
2/1	Double Density	24	1632	120	
2/6	CRT III	24	1224	90	
2/7	Triple Density	24	2448	180	
2/8	Hex Density	24	4896	360	*)

*) *consecutive horizontal dots cannot be printed.*

Example: box 8x8 dots with center point 2x2 dots, standard density, 8 dots / column
hex: 1B 2A 00 08 00 FF 81 81 99 99 81 81 FF

Table 7: Character Set Selection

Escape Sequence	Function
ESC 6	Enlarge Print Code Area (128-159 dec.)
ESC 7	Enable Upper Control Code (128-159 dec.)
ESC R P1	Select National Version P1 = 0/0 : U.S.A. P1 = 0/1 : FRANCE P1 = 0/2 : GERMANY P1 = 0/3 : U.K. P1 = 0/4 : DENMARK P1 = 0/5 : SWEDEN P1 = 0/6 : ITALY P1 = 0/7 : SPAIN P1 = 0/8 : JAPAN P1 = 0/9 : NORWAY P1 = 0/A : DENMARK 2 P1 = 0/B : SPAIN 2 P1 = 0/C : LATIN AM. P1 = 0/D : TURKEY P1 = 4/0 : LEGAL
ESC t P1	Select Character Table P1 = 0/0 : Italics Character Table P1 = 0/1 : Extended Graphics Character Table P1 = 0/2 : User Defined Character Table

Table 8: ESC / P2 Commands

Escape Sequence	Function
ESC (c P1 P2 P3 P4 P5	**Set page format** Sets top and bottom margins in the defined units. P1 = 04 00 tm = P2 + P3 x 256 tm: top margin in units tm bm = P4 + P5 x 256 bm: bottom margin in units bm
ESC (C P1 P2 P3	**Set page length in defined unit** Define page length in units P1 = 02 00 pl = P2 + P3 x 256
ESC (V P1 P2 P3	**Set absolute vertical print position** Define absolute vertical print position in units P1 = 02 00 avpp = P2 + P3 x 256 avpp: define print position from top margin in defined units
ESC (v P1 P2 P3	**Set relative vertical print position** Define relative vertical print position in units P1 = 02 00 rvpp = P2 + P3 x 256 rvpp: moves the print position in defined units.

Table 8: (Cont.) ESC / P2 Commands

Escape Sequence	Function
ESC X P1 P2 P3	**Select font by pitch and point** P1 = 0 : No change in pitch P1 = 1 : Selects proportional spacing P1 = 18, 24, 30, 36, 42, 48, 60 or 72 Selects fixed pitch equal to 360/m cpi pz = P2 + P3 x 256 pz: Point size in 0,5 points; 1 point equals 1/72 inch pz = 0: No change in point size pz = 16, 20, 21, 24, 28, 32, 36, 40, 42, 44, 48, 52, 56, 60, 64
ESC (U P1 P2	**Set unit** P1 = 01 00 P2 = 10, 20, 30, 40, 50, 60 /3600" P2 = 10; Standard
ESC c P1 P2	**Set horizontal motion index (HMI)** Define HMI-Index Change pitch value in n/360"-steps HMI = P1 + P2 x 256 HMI max. 3 inch

Table 8: (Cont.) ESC / P2 Commands

Escape Sequence	Function
ESC (t n1 n2 Pn P1 P2	**Assign character table** n1 = 3, n2 = 0 Pn = Parameter of ESC t : 0, 1, 2, 3, "0", "1", "2" or "3" P1 P2 = character table 0 0 : italic 1 0 : PC 437 (USA) 3 0 : PC 850 (Multilingual) 7 0 : PC 860 (Portugal) 8 0 : PC 863 (French-Canada) 9 0 : PC 865 (Norway) 29 15 : ISO 8859-15; LATIN 9 29 16 : ISO 8859-1, LATIN 1 44 0 : PC 858 (Multilingual + Euro) The character table assigned by Pn is one of the four tables which will be selected by the ESC t command.
ESC t P1	**Select character table** Selects the character table to be used for printing from among the four character tables which are assigned by ESC (t command. Pn = 0/0 or 3/0 : Character Table 0 Pn = 0/1 or 3/1 : Character Table 1 Pn = 0/2 or 3/2 : Character Table 2 Re-maps downloaded Characters from the positions 0 to 127 to the positions 128 to 255. Pn = 0/3 or 3/3 : Character Table 3 **Default Setting** Pn = 0/0 or 3/0 : Italics Character Table Pn = 0/1 or 3/1 : CP 437 Pn = 0/2 or 3/2 : User Defined Character Table Pn = 0/3 or 3/3 : CP 437

Table 8: (Cont.) ESC / P2 Commands

Escape Sequence	Function
ESC (^ P1 P2	**Print data as characters** Prints n data bytes as characters, not control codes pd = P1 + P2 x 256
ESC (G P1 P2	**Select graphics mode** P1 = 01 00 P2 = 1 or 49 Graphics mode may be reset by ESC @.
ESC . P1 P2 P 3 P4 P5 P6	**Print raster graphics** P1 = 0 : graphics mode non compressed P1 = 1 : graphics mode compressed P2 = 10, 20 : vertical resolution in 3600/v DPI P3 = 10, 20 : horizontal resolution in 3600/h DPI P4 : vertical dot count (rows of dot graphics) 1 < P4 < 24 hzd : horizont dot count (columns of dot graphics) hzd = P5 + P6 x 256 Combination P2 = 10, P3 = 20 is not possible.

Table 9: Further Control Sequences, supported by EPSON LQ Emulation Mode *(Native Commands)*

Escape Sequence	Mnemonic	Function
$$	$$	Control String Introducer (CSI) for ESC [
$$/	$$/	control String Introducer for ESC
ESC [< s	EJF	Eject Form; this command causes a vertical form feed to the beginning of the next page.
ESC [> s	IF	Insert Form
ESC [P1 *SP* X	SPQ	Select Print Quality P1 = 0: LQ P1 = 1: NLQ; this is only valid if the NLQ type style is selected. P1 = 2: DRAFT P1 = 3: HSD (high speed draft)
	Note:	The LQ / NLQ selection becomes active if a LQ-/ NLQ-font is selected. Draft / HSD becomes active if type style DATA is selected.
ESC [P1 ; P2 *SP* r	SM #	Select Macro and Change Emulation P1 = 1: Macro 1 P1 = 2: Macro 2 P1 = 3: Macro 3 P1 = 4: Macro 4 P2 = 0: no change of emulation P2 = 2: IBM ProPrinter Emulation P2 = 3: IBM ProPrinter AGM Emulation P2 = 4: EPSON Emulation

Table 9 (Cont.): Further Control Sequences, supported by **EPSON LQ Emulation Mode** *(Native Commands)*

Escape Sequence	Mnemonic	Function
ESC [P1 ; P2 w	SNVCT	Set National Version and Code Table P1 = 1 - 15 national version depending on selected character set (see Appendix C Char. Set Tables) P2 = 3 digit code of the code table (see command SCT below) P1 for national version **EPSON EXT. GCT**: P1 = 1 : U.S.A P1 = 2 : France P1 = 3 : Germany P1 = 4 : U.K. P1 = 5 : Denmark P1 = 6 : Sweden P1 = 7 : Italy P1 = 8 : Spain P1 = 9 : Japan P1 = 1 0 : Norway P1 = 1 1 : Denmark 2 P1 = 1 2 : Spain 2 P1 = 1 3 : Latin AM P1 = 1 4 : Turkey P1 = 1 5 : Legal
P1 for **IBM CODE PAGE:** P1 = 1 : CP 437 P1 = 2 : CP 850 P1 = 3 : CP 860 P1 = 4 : CP 863 P1 = 5 : CP 865 P1 = 6 : CP 858 P1 for **CODE PAGE EE2:** P1 = 1 : CP 771 P1 = 2 : CP 773 P1 = 3 : CP 774 P1 = 4 : CP 775 P1 = 5 : CP BALTIC RIM		P1 for **CODE PAGE EE**: P1 = 1 : CP 437 GK P1 = 2 : CP 851 GK P1 = 3 : CP 928 GK P1 = 4 : CP 855 CYRI P1 = 5 : CP 866 P1 = 6 : CP 869 P1 = 7 : CP 852 P1 = 8 : KAMENICKY P1 = 9 : ISO LATIN 2 P1 = 1 0 : MAZOVIA P1 = 1 1 : CP 437 HUN P1 = 1 2 : CP 852 SEE P1 = 1 3 : CP 866 LAT P1 = 1 4 : WIN LAT2
ESC [; P2 w	SCT	Set Code Table P2 = 3 bit code of the code table P2 = 0 3 1 : ISO 8859/1; LATIN 1 P2 = 0 3 1 : ISO 8859/15; LATIN 9 P2 = 0 6 1 : IBM Set 1 P2 = 0 6 2 : IBM Set 2 P2 = 0 6 3 : IBM Code Page 1) P2 = 0 7 1 : EPSON Ext. G. C. T P2 = 1 0 0 : CODE PAGES EE P2 = 1 0 1 : CODE PAGES EE2

1) depending on selected character set (P1 in SNV) the IBM CODE PAGE 437, 850, 860, 863, 865, or 858 (P1 = 6; P2 = 63) will be activated!

Table 9 (Cont.): Further Control Sequences, supported by EPSON LQ Emulation Mode *(Native Commands)*

Escape Sequence	Mnemonic	Function
ESC [; P2 ; P3 ; P4 ; P5 ; P6 ; P7 *SP* z *see Appendix F BARCODE Programming*	BH	Barcode Header P2: Barcode type P3: Height of barcode P4: Width of the thin bars P5: Width of the thin gaps P6: Ratio width to thin (bars / gaps) P7: Uni-directional or bi-directional printing 0 : or not programmed: means no changes 1 : uni-directional printing in LQ 2 : bi-directional printing in LQ 3 : uni-directional printing in NLQ 4 : bi-directional printing in NLQ
ESC [? 0 h	SMBC	Set Mode Barcode
ESC [? 0 *l*	RSBC	Reset Mode Barcode

Hex Code	Format	Page
00	Null	E-2
08	Backspace	E-2
09	Horizontal Tab	E-2
0A	Line Feed	E-2
0B	Vertical Tab	E-2
0C	Form Feed	E-2
0D	Cariage Return	E-2
11	Select Printer	E-2
12	Cancel Condensed Mode	E-2
13	Deselect Printer	E-2
14	Cancel Double Width	E-2
18	Cancel Buffer	E-2
1B	Escape	E-2
20	Space	E-2
7F	Delete	E-2
1B 0E or 0E	Select Double Width for One Line	E-2/6
1B 0F or 0F	Select Condensed Mode	E-2/6
1B 23	Cancel Most Significant Bit Control	E-2
1B 30	Set Line Space to $^1/_8$ "	E-3
1B 32	Set Line Space to $^1/_6$ "	E-3
1B 34	Set Italics	E-8
1B 35	Cancel Italics	E-8
1B 36	Enlarge Print Code Area	E-15
1B 37	Enable Upper Control Code Area	E-15
1B 3C	Select Unidirectional Mode (one line)	E-8
1B 3D	Set Most Significant Bit to 0	E-2
1B 3E	Set Most Significant Bit to 1	E-2
1B 40	Initialize Printer	E-2
1B 45	Select Emphasized (bold)	E-9
1B 46	Cancel Emphasized	E-9

Hex Code	Format	Page
1B 47	Select Double Strike (bold)	E-9
1B 48	Cancel Double Strike	E-9
1B 4D	Select Elite (12 cpi)	E-9
1B 4F	Cancel Automatic Perforation Skip	E-3
1B 50	Select Pica (10 cpi)	E-9
1B 54	Cancel Superscript/Subscript	E-9
1B 67	Select Pitch 15 cpi	E-10
24 24	Control String Introducer for ESC [	E-20
24 24 2F	Control String Introducer for ESC	E-20
1B 19 P_1	Form Feed	E-4
1B 20 P_1	Select Intercharacter Space	E-6
1B 21 P_1	Select Multible Print Mode	E-6
1B 25 00 / 1B 25 01	Select Standard- / User Defined Char. Set	E-6
1B 2B P_1	Set line Space to $^{P1}/_{360}$ "	E-3
1B 2E P_1	Select Variable Tab Channel	E-4
1B 2D 01 / 1B 2D 00	Select / Cancel Underline	E-8
1B 33 P_1	Set Line Space to $^{P1}/_{180}$ "	E-3
1B 41 P_1	Set line Space to $^{P1}/_{60}$ "	E-3
1B 42 00	Clear Vertical Tabs	E-3
1B 43 P_1	Set Form Length in Lines	E-3
1B 44 00	Clear Horizontal Tabs	E-8
1B 4A P_1	Perform $^{P1}/_{180}$ Line Feed	E-3
1B 4E P_1	Set Automatic Perforation Skip	E-3
1B 51 P_1	Set Right Margin	E-9
1B 52 P_1	Set National Version	E-15
1B 53 00 / 1B 53 01	Select Superscript / Subscript	E-9
1B 55 00 / 1B 55 01	Cancel / Select Unidirectional Printing	E-9
1B 57 00 / 1B 57 01	Cancel / Select Double Width	E-9
1B 61 P_1	Select Justification	E-9

Hex Code	Format	Page
1B 6A P_1	Perform $^{P1}/_{180}$ Reverse Line Feed	E-4
1B 6B P_1	Select Font	E-10
1B 6C P_1	Set Left Margin	E-10
1B 70 00 / 1B 70 01	Cancel / Select Proportional	E-10
1B 71 P_1	Select Character Style	E-10
1B 74 P_1	Select Character Table	E-15 E-18
1B 77 00 / 1B 77 01	Cancel / Select Double Height	E-11
1B 78 P_1	Select Character Quality	E-11
1B 24 P_1 P_2	Set Absolute Horizontal Position	E-6
1B 26 00 P_1 P_2 P_3 P_4 P_5 data	Define User Defined Characters	E-7
1B 28 2D P_1 P_2 P_3 P_4 P_5	Select Line Marking	E-8
1B 28 43 P_1 P_2 P_3	Set Page Length in defined Unit	E-16
1B 28 47 P_1 P_2	Select Graphics Mode	E-19
1B 28 55 P_1 P_2	Set Unit	E-17
1B 28 56 P_1 P_2 P_3	Set absolute vertical Print Position	E-16
1B 28 63 P_1 P_2 P_3 P_4 P_5	Set Page Format	E-16
1B 28 74 P_1 P_2 P_3 P_4	Assign Character Table	E-18
1B 28 76 P_1 P_2 P_3	Set relative vertical Print Position	E-16
1B 28 5E P_1 P_2	Print Data as Character	E-19
1B 2A P_1 P_2 P_3 data	Select Various Graphics Modes	E-14
1B 2E P_1 P_2 P_3 P_4 P_5 P_6	Print Raster Graphics	E-19
1B 3A 00 P_1 00	Copy ROM Character Set to RAM	E-8
1B 3E 4B P_1	Reassign Graphics Mode K	E-13
1B 3E 4C P_1	Reassign Graphics Mode L	E-13
1B 3E 59 P_1	Reassign Graphics Mode Y	E-13
1B 3E 5A P_1	Reassign Graphics Mode Z	E-13
1B 42 P_1....P_{16} 00	Set Vertical Tabs	E-3
1B 43 00 P_1	Set form Length in Inches	E-3
1B 44 P_1 P_2...P_{32} 00	Set Horizontal Tabs	E-9

Hex Code	Format	Page
1B 4B P_2 P_3 data	Standard Density Graphics Mode	E-13
1B 4C P_2 P_3 data	Double Density Graphics Mode	E-13
1B 58 P_1 P_2 P_3	Select Font by Pitch and Point	E-13
1B 59 P_2 P_3 data	Double Speed & Double Density Graph. Mode	E-13
1B 5A P_2 P_3 data	Quadruple Density Graphics Mode	E-13
1B 5B 3B P_2 73	AGC / PCC Procedure	E-5
1B 5B 3B P_2 77	Set Code Table	E-21
1B 5B 3B P_2 3B P_3 3B P_4 3B P_5 3B P_6 3B P_7 20 7A	Barcode Printing	E-22
1B 5B 3C 73	Eject Form	E-20
1B 5B 3E 73	Insert Form	E-20
1B 5B 3E P_1 3B P_2 3B P_3 3B P_4 73	Select Paper Source and Insert Form	E-4
1B 5B 3E 30 68	Set Mode Barcode	E-22
1B 5B 3E 30 6C	Reset Mode Barcode	E-22
1B 5B P_1 20 58	Select Print Quality	E-20
1B 5B P_1 3B P_2 20 72	Select Makro and Change Emulation	E-20
1B 5B P_1 3B P_2 20 42	Graphic Size Modification	E-11
1B 5B P_1 3B P_2 77	Set National Version and Code Table	E-21
1B 5B P_1 3B P_2 78	Select Font and Character Pitch	E-12
1B 5B P_1 77	Set National Version	E-21
1B 5C P_1 P_2	Set Relative Horizontal Position	E-6
1B 62 P_1 00	Clear Vertical Tabs in Channel P_1	E-4
1B 62 m P_1 P_2...P_9 00	Set Vertical Tab in Channel P_1	E-4
1B 63 P_1 P_2	Set Horizontal Motion Index (HMI)	E-17

Hex - Decimal Conversion Table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	9	25	41	57	73	89	105	121	137	153	269	185	201	217	233	249
A	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
B	11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
C	12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
D	13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
E	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
F	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

Appendix F Barcode Quick Reference

1. Introduction

The barcode print facility is available in all three emulations.

2. Programming

There are three escape sequences to print barcodes

- The first sequence is to define the Barcode Header. The type of barcode as well as all parameters are selected by a header. The header does not affect any parameters outside the barcode application and remains valid until another header is transmitted or the printer is turned off. This can be done at any time but before barcode printing.

  The header has the following format:

  ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7 8 **z** *Note:* **8** = Space

- In step two, the ESC-sequence "Set Mode Barcode (SMBC)" starts the barcode printing.

  ESC [? 0 h

- Finally, the ESC-sequence "Reset Mode Barcode (RMBC)" will stop printing.

  ESC [? 0 *l*

Note: Between **SMBC** and **RMBC** are only printable characters tolerated (no CR or LF).

2.1 Barcode Header

Format	Function/Parameter	Hex Code
BH	Barcode Header P_2 = Barcode type; P_3 = Height of barcode; P_4 = Width of thin bars; P_5 = Width of thin gaps; P_6 = Ratio width to height; P_7 = Uni/Bidirectional printing	1B 5B 3B P_2 3B P_3 3B P_4 3B P_5 3B P_6 3B P_7 20 7A
SMBC	Start of Barcode	1B 5B 3F 30 68
RMBC	Stop Barcode	1B 5B 3F 30 6C

Barcode Header Parameters

P_2 Barcode type

- default = **101 (**Code 39 horizontal)

Type	horizontal	horizontal + human readable text	vertical	vertical + human readable text
Code 39	101	201	301	401
2 of 5 industrial	102	202	302	402
2 or 5 interleaved	103	203	303	403
Codabar (Monarch)	104	204	304	404
EAN 8	105	205	not applicable	not applicable
EAN 13	106	206	not applicable	not applicable
Code 93	107	207	307	407
MSI Mod 10/10	108	208	308	408
UPC-E	109	209	not applicable	not applicable
UPC-A	110	210	not applicable	not applicable
Code 128 (EAN 128)	111	211	311	411
Postnet	112	not applicable	not applicable	not applicable
KIX Code	113	not applicable	not applicable	not applicable

P_3 Height of barcode

- default: $^3/_{12}$" - 0.64 cm

All characters in a line are automatically repeated according to the selected barcode height. This is also true for plain text!

- P_3 * $^1/_{12}$"
- possible values from:
  0 to 40 (30_H to 34_H30_H) or (48_D to 52_D48_D) for vertical barcodes
  0 to 99 (30_H to 39_H39_H) or (48_D to 57_D57_D) for horizontal barcodes

Barcode	Height in % of barcode length	minimum height in mm
Code 39	25	20 (0.8")
Codabar	25	20 (0.8")
Code 93	15	6.25 (0.25")
Code 128	15	6.25 (0.25")

P_4 Width of the thin bars (default: $^{2}/_{144}$" = 0.35 mm)

Note: The width of bars and gaps should be equal. For this, the parameters $\mathbf{P_4}$ and $\mathbf{P_5}$ should not deviate more than one step.

for horizontal Barcode

P_4	hex	dec	inch	mm
0	30	48	2/144	0,35
1	31	49	3/144	0,53
2	32	50	4/144	0,70
3	33	51	5/144	0,88
4	34	52	6/144	1,05
5	35	53	7/144	1,23
6	36	54	8/144	1,41
7	37	55	9/144	1,58

for vertical Barcode

P_4	hex	dec	inch	mm
0	30	48	2/180	0,28
1	31	49	3/180	0,42
2	32	50	4/180	0,56
3	33	51	5/180	0,70
4	34	52	6/180	0,85
5	35	53	7/180	0,99
6	36	54	8/180	1,12
7	37	55	9/180	1,27

P_5 Width of the thin gaps (default: $^{2}/_{144}$" = 0.35 mm)

The values are the same as in $\mathbf{P_4}$

P_6 Ratio Width to Thin   (default: **0** (2 to 1))

P_6 value	Code 39 2 of 5 industrial 2 of 5 interleaved Codabar Code 93 MSI mod 10/10 Code 128	EAN 8 EAN 13 UPC-A UPC-E
0	2.0 to 1	SC3
1	2.5 to 1	SC6
2	3.0 to 1	SC9
3	3.5 to 1	SC3

Note: Code 93, MSI 10/10, Code 128 are fixed 2.0 to 1
Best results for Code 39, 2 of 5 industrial, 2 of 5 interleaved, and Codabar with 2.5 to 1

P_7 Uni-directional or bi-directional printing - standard 0 uni-directional

values are:
0 or not programmed means no changes
1 uni-directional printing in LQ
2 bi-directional printing in LQ
3 uni-directional printing in NLQ
4 bi-directional printing in NLQ

Note: A switch from uni-directional to bi-directional printing is only possible if the parameter **UNI-DIRECT.CMD** is set to **YES** via operator panel or ESC-sequence.

Start Position of Barcode Printing

The start position for barcode printing is the current print position.
For both horizontal and vertical printing, the print position after printing barcodes is the same line as the start position next to the barcode printed.

2.2 Barcode Programming Examples

Note: All examples are coded in standard uni-directional printing - that means the parameter "P_7" is not used.
In the following examples, 8 stands for "Space".
The small square before and after the printed barcode indicates the actual print position.
Between **Start Barcode** and **Stop Barcode** are only printable characters tolerated (no CR or LF).

Barcode Example for Code 39

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 201 ; 8 ; 1 ; 1 ; 1 ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	*** C** 8 **O** 8 **D** 8 **E** 8 8 8 **3 9 ***
Stop Barcode:	**ESC [? 0** *l*

* C O D E 3 9 *

Barcode Example for 2 of 5 Industrial

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 202 ; 8 ; 1 ; 1 ; 1 ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**: 1 2 3 4 5 6 7 8 9 0 ;**
Stop Barcode:	**ESC [? 0** *l*

: 1 2 3 4 5 6 6 7 8 9 0 ;

Barcode Example for 2 of 5 Interleaved

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 203 ; 8 ; 1 ; 1 ; 1 ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**: 1 2 3 4 5 6 7 8 9 0 ;**
Stop Barcode:	**ESC [? 0** *l*

: 1 2 3 4 5 6 7 8 9 0 ;

Barcode Example for Codabar (Monarch)

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 204 ; 8 ; 1 ; 1 ; 1 ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**a 0 1 2 3 4 5 6 7 8 9 t**
Stop Barcode:	**ESC [? 0** *l*

a 0 1 2 3 4 5 6 6 7 8 9 t

Barcode Example for EAN 8

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 205 ; 8 ; ; ; 1 ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**4 0 1 2 3 4 5 5**
Stop Barcode:	**ESC [? 0** *l*

4 0 1 2 3 4 5 5

Barcode Example for EAN 8 ADD-2

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 205 ; 8 ; ; ; 1 ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**4 0 1 2 3 4 5 5 1 2**
Stop Barcode:	**ESC [? 0** *l*

1 2

4 0 1 2 3 4 5 5

Barcode Example for EAN 8 ADD-5

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 205 ; 8 ; ; ; 1 ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**4 0 1 2 3 4 5 5 8 6 1 0 4**
Stop Barcode:	**ESC [? 0** *l*

8 6 1 0 4

4 0 1 2 3 4 5 5

Barcode Example for EAN 13

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 206 ; 8 ; ; ; 1 ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**4 1 2 3 4 5 6 7 8 9 0 1 8**
Stop Barcode:	**ESC [? 0** *l*

4 1 2 3 4 5 6 7 8 9 0 1 8

Barcode Example for EAN 13 ADD-2

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 206 ; 8 ; ; ; 1 ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**4 1 2 3 4 5 6 7 8 9 0 1 8 1 2**
Stop Barcode:	**ESC [? 0** *l*

Barcode Example for EAN 13 ADD-5

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 206 ; 8 ; ; ; 1 ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**4 1 2 3 4 5 6 7 8 9 0 1 8 8 6 1 0 4**
Stop Barcode:	**ESC [? 0** *l*

Barcode Example for Code 93

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 207 ; 8 ; 1 ; 1 ; ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**a C + O + D + E** 8 **9 3 W I e**
Stop Barcode:	**ESC [? 0** *l*

C + 0 + D + E 9 3 W I

Barcode Example for MSI Mod 10/10

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 208 ; 8 ; 1 ; 1 ; ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**: 1 2 3 4 5 6 7 4 1 ;**
Stop Barcode:	**ESC [? 0** *l*

: 1 2 3 4 5 6 7 4 1 ;

Barcode Example for UPC-E

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 209 ; 8 ; ; ; 1 ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**0 1 2 3 4 5 6 5**
Stop Barcode:	**ESC [? 0** *l*

1 2 3 4 5 6

Barcode Example for UPC-E ADD-2

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 209 ; 8 ; ; ; 1 ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**0 1 2 3 4 5 6 5 1 2**
Stop Barcode:	**ESC [? 0** *l*

1 2

1 2 3 4 5 6

Barcode Example for UPC-E ADD-5

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 209 ; 8 ; ; ; 1 ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**0 1 2 3 4 5 6 5 8 6 1 0 4**
Stop Barcode:	**ESC [? 0** *l*

Barcode Example for UPC-A

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 210 ; 8 ; ; ; 1 ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**0 1 2 3 4 5 6 7 8 9 0 5**
Stop Barcode:	**ESC [? 0** *l*

Barcode Example for UPC-A ADD-2

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 210 ; 8 ; ; ; 1 ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**0 1 2 3 4 5 6 7 8 9 0 5 1 2**
Stop Barcode:	**ESC [? 0** *l*

Barcode Example for UPC-A ADD-5

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 210 ; 8 ; ; ; 1 ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**0 1 2 3 4 5 6 7 8 9 0 5 8 6 1 0 4**
Stop Barcode:	**ESC [? 0** *l*

Barcode Example for Code 128

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 211 ; 8 ; 1 ; 1 ; ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**C o d e** 8 **1 2 8**
Stop Barcode:	**ESC [? 0** *l*

C o d e   1 2 8

Barcode Example for Code 128 using FNC1 = Coding **] C 1**

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 211 ; 8 ; 1 ; 1 ; ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**] C 1 0 0 3 4 0 1 2 3 4 5 1 2 3 4 5 6 7 8 9 5**
Stop Barcode:	**ESC [? 0** *l*

0 0 3 4 0 1 2 3 4 5 1 2 3 4 5 6 7 8 9 5

Barcode Example for POSTNET

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 112 ; ; ; ; ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**1 2 3 4 5 6 7 8 9 0 1**
Stop Barcode:	**ESC [? 0** *l*
Data:	**CR LF LF**
	Mark Pollan CR LF
	101 Main St CR LF
	Anytown US 12345-6789

```
Mark Pollan
101 main St
Anytown US 12345-6789
```

Barcode Example for KIX - PTT, Post Nederland

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 113 ; ; ; ; ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	**1 2 3 4 5 6 7 8 9 0**
Stop Barcode:	**ESC [? 0** *l*

Programming two Barcodes symbols on the same line

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 201 ; 7 ; 0 ; 0 ; 1 ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	*** C** 8 **O** 8 **D** 8 **E** 8 8 8 **3 9 ***
Stop Barcode:	**ESC [? 0** *l*
Blank zone	8 8 8
Start Barcode:	**ESC [? 0 h**
Data:	*** C** 8 **O** 8 **D** 8 **E** 8 8 8 **3 9 ***
Stop Barcode:	**ESC [? 0** *l*

* C O D E   3 9 *   * C O D E   3 9 *

Programming two Barcodes symbols separated by CR and LF

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 201 ; 7 ; 0 ; 0 ; 1 ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	*** C** 8 **O** 8 **D** 8 **E** 8 8 8 **3 9 ***
Stop Barcode:	**ESC [? 0** *l*
Blank zone:	**CR LF LF LF LF LF LF LF**
Start Barcode:	**ESC [? 0 h**
Data:	*** C** 8 **O** 8 **D** 8 **E** 8 8 8 **3 9 ***
Stop Barcode:	**ESC [? 0** *l*

* C O D E 3 9 *

* C O D E 3 9 *

Programming two Barcodes symbols in landscape on the same line

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 401 ; 7 ; 0 ; 0 ; 1 ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	*** C** 8 **O** 8 **D** 8 **E** 8 8 8 **3 9 ***
Stop Barcode:	**ESC [? 0** *l*
Blank zone:	8 8 8
Start Barcode:	**ESC [? 0 h**
Data:	*** C** 8 **O** 8 **D** 8 **E** 8 8 8 **3 9 ***
Stop Barcode:	**ESC [? 0** *l*

Programming two Barcodes symbols in landscape separated by CR / LF

Barcode Header:	**ESC [; P_2 ; P_3 ; P_4 ; P_5 ; P_6 ; P_7** 8 **z**
	ESC [; 401 ; 7 ; 0 ; 0 ; 1 ; 8 **z**
Start Barcode:	**ESC [? 0 h**
Data:	*** C** 8 **O** 8 **D** 8 **E** 8 8 8 **3 9 ***
Stop Barcode:	**ESC [? 0** *l*
Blank zone:	**CR LF LF LF LF LF LF LF LF LF LF LF LF**
Start Barcode:	**ESC [? 0 h**
Data:	*** C** 8 **O** 8 **D** 8 **E** 8 8 8 **3 9 ***
Stop Barcode:	**ESC [? 0** *l*

Appendix G Information for the System Manager

Reset off Menu Access

To reactivate the menu access function, perform the following steps:

- Switch off the printer. Press the  and  keys simultaneously. While holding down the two keys, switch on the printer. When the message **MENU ACCESS** (**MENUE SICHERN**) is displayed, release the keys. Now you are able to change the menu access function. If the new setting is supposed to be permanent, don't forget the **SAVE** function.

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Printer drivers

The printer drivers for Windows 3.x, 95, 98, NT 4.0 are available.
(see **CD-RO**M).